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No. 3

## UNITED STATES SHIP BUILDING CO.'S TANGLE.

That the legal struggle between the reorganization committee of the United States Ship Building Co. and the protesting bondholders has by no means ended, became apparent last week from statements made by counsel on both sides. The decision of Judge Putnam of the United States circuit court of Maine, mentioned elsewhere in this issue, in refusing to appoint Receiver James Smith ancillary receiver for the company in that state, has given the contest a new turn and made the ultimate settlement a matter of the greatest uncertainty. Thus far any progress made in the affair has been away from rather than toward an agreement between the receiver and his counsel and the Sheldon reorganization committee, and this, in spite of the fact that Judge Kirkpatrick directed the receiver to confer with the reorganization committee and admonished both sides to work for the early rehabilitation of the company on a smooth working basis. The chief issue is again between the reorganization committee and the protesting bondholders. It is significant of the situation that contending counsel are charging each other with mis-statements. William N. Cromwell, counsel for the Sheldon committee, said:

"We learned that the receiver had served notice on all the corporations constituent to the United States Ship Building Co., terminating, on the expiration of five days, the leases of the several plants, notwithstanding that the plants are necessary for the continuance of operation by the constituent companies, each of which is engaged in large ship construction. The reorganization committee regards this as detrimental to the interests of all concerned, and for this and other reasons requested leave to be heard in the various states."

The reply of Judge Putnam to the application referred to by Mr. Cromwell was that counsel might be heard if they so desired, but that he already had a very clear idea of the case and that he was convinced that Judge Kirkpatrick's action could not be sustained. Judge Putnam's position regarding this question is well known, he having decided against the appointment of ancillary receiver under the New Jersey insolvency act in cases heretofore brought before him. The reorganization committee does not therefore anticipate that he will reverse himself in this matter.

On the other hand, the minority bondholders insist that Judge Putnam has not declined to appoint Mr. Smith as ancillary receiver, but has merely stated that he would require notice of the application to be given.

Receiver James Smith admits that he has signed an order terminating the leases of the subsidiary companies on the properties operated by them. The United States Ship Building Co. owns all the ship yards and leases them to the subsidiary companies for a rental equal to the net profits. These leases are all terminable at the option of the ship building company on five days' notice. This option Mr. Smith has exercised. This order of the receiver is a step in the proceedings which counsel for the reorganization committee intend to resist to the end. When asked for his reason for the order terminating the leases Receiver Smith said:

"I took that means of bringing all of the properties under my authority as receiver. Otherwise they would have continued in the charge of the subsidiary companies of which I am not the receiver."

It is no secret that some of the subsidiary companies are trying to buy back their plants from the ship building company and operate them as independent plants as heretofore. There are difficulties, however, in the way of this. The plants which it is desired to buy back are the prosperous ones, and if they were eliminated from the combination the weaker ones would have harder sledding than ever.

## CHAIN BOATS ON THE ERIE CANAL.

A dispatch from Albany says that the Inland Transportation Co. of New York has taken options on most of the boats now in use on the Erie canal and only awaits the sanction of the legislature to install a system of chain propulsion the whole length of the canal. Consent has already been given for an experimental plant 10 miles long. The system has been in successful use on the River Elbe, Germany, for thirty-seven years. The American patents are owned by Joseph C. Tone of Irenequoit, who has used the system on a river ferry near Rochester. The Erie canal fleet, which once numbered 7,000, has dwindled to about 700 serviceable boats. Of these about 400 are fit for grain traffic. It is the purpose of the company to acquire them all for use as tow barges.

The main feature of the system is a heavy chain laid along the bed of the canal. This is to be gripped by power boats, the chain passing lengthwise through the hull and over and under sheaves or rollers, to which power is applied by the boat's engines. The power is thus directly applied, and, it is claimed, the machinery carries the boat along evenly and smoothly, with the least possible wear and tear. Each power boat is expected to tow

at least twenty-five barges, each carrying 240 tons, at an average speed of four miles an hour. The aggregate tonnage of one fleet would be 6,000 tons, equal to three train loads. The estimated cost is one-half mill per ton per mile. The cost of installation is given as 50 cents per foot. The company, if successful in its dealings with the legislature, expects to provide towage for private boat owners at a cost to be fixed by the state. The tolls, it is claimed, would be much less than the cost of mule or steam power under present conditions.

## CONSTRUCTION OF STEEL STEAM VESSELS.

The last annual report of Mr. E. T. Chamberlain United States commissioner of navigation, contains a summary of progress in the building of steel steam merchant vessels in the United States during the past ten years. The total construction of such vessels for ten years ended June 30, 1902, was 1,151,952 gross tons, of which 681,494 tons were built on the great lakes and western rivers, 433,643 tons on the Atlantic seaboard and 36,815 tons on the Pacific coast. The year ended June 30, 1902, showed the largest output—270,739 tons. Cleveland, with 273,590 gross tons in the ten years, has been the largest center for this industry. In this summary such ship building centers as Philadelphia, Newport News and San Francisco do not show up to advantage from a tonnage standpoint in comparison with Cleveland and other places on the lakes, as the seaboard cities engage largely in the building of vessels of war, while the output of the lake cities is merchant vessels entirely. It is also true that large merchant vessels, 2,000 tons and upwards, built for salt water service, involve a much greater cost and take longer to build than vessels of similar tonnage for lake service; and it may be added that not only the ships but the industries connected with them on the lakes have government protection from foreign competition, while our foreign shipping on the seas has no protection, and there are therefore practically no orders to be had by seaboard yards for ships to engage in foreign trade.

Merchant steam vessels of all kinds (steel, iron and wood) of 1,000 tons and upward owned in the United States on June 30, 1902, numbered 891 of 2,189,214 gross tons. Of these vessels, which, as their tonnage indicates, belong to the best class, 485 of 1,178,875 tons were owned on the lakes. In other words, 53 per cent. of the best steam tonnage of the country is owned on the lakes.

The same report shows that on the same date, June 30, 1902, there were owned on the Atlantic seaboard 874 steel and iron vessels (steam and sail) of 976,594 gross tons. On the lakes the number of steel and iron vessels was 400 (even figures), which is less than half the number on the Atlantic seaboard, but the lake craft were of a larger kind, as their aggregate tonnage was 975,201, or practically equal to that of the seaboard.

## NAVY CONSIDERING BOILER QUESTION.

Members of the board of construction of the navy express the opinion that the most important subject now before the department is that of boilers and machinery weights for ships of the future. At a meeting of the board last week the question of providing the ships under construction, in accordance with the contracts, with the Niclausse type of boiler, which did not prove satisfactory on the Maine, was given careful consideration. It was the opinion of the members of the board, unofficially expressed, that it would not be advisable to make any additional contracts providing for this type of boiler, but whether it would be well to remove the boilers from the five ships under construction was not decided, and will not be until the Maine has received additional tests. Rather disquieting reports touching on the condition of the boilers of the Massachusetts, Iowa, Indiana, Helene and Wilmington have been received at the navy department. According to officers of the navy who ought to be cognizant of the conditions of these ships their boilers have a leaky tendency and are worn to some extent because the weight of the machinery was so reduced upon the plans and specifications upon which they were built. Rear Admiral Melville, chief of the bureau of steam engineering, has for some time been urging that his department be granted a higher percentage of weight than has heretofore been granted in making the plans for the ships of the navy.

The torpedo boat destroyer Macdonough was delivered to the government by the Fore River Ship & Engine Co. of Quincy, Mass., on July 3 and taken to the Charlestown navy yard. She is a sister to the Lawrence, delivered by the same company a few weeks ago and now at the Newport torpedo station. The Macdonough is 246 ft. long, 22 ft. 3 in. wide, and 14 ft. deep, with a displacement of about 400 tons. Her two engines have 8,400 C. H. P., and with unselected steam coal carried her well beyond 26 knots at her endurance test, making 332.7 revolutions against 331 required.

### GREAT INTEREST IN THE TURBINE.

**New Calais and Dover Channel Steamer, The Queen, a Magnificent Passenger Ship, said to be a Decided Success—German and British Interests in Submarines—Scotch Shipping Letter.**

Glasgow, July 6.—The Hon. C. A. Parsons, F. R. S., has been enlarging to naval architects on the marine turbine and its application to the propulsion of vessels. Having reviewed at length the improvements made since the Turbina was first fitted with the steam turbine in 1894, he said that after six years of unremitting work by a highly skilled and devoted staff, and the expenditure of much money by the company, there was no turbine-propelled vessel actually in commission in the British navy, though two turbine vessels were building, and one nearly completed vessel, the Velox, being purchased into the service. Both the Viper and Cobra were unfortunately lost before substantial practical experience in commission had been obtained. During and after the occurrence of these events the turbine company directed their attention to the important application of their system to vessels of moderate speeds, and their efforts in this direction had met with much encouragement and great success. The names of Capt. John Williamson, the managing owner, and Messrs. Denny & Co., the builders, would ever be associated with the King Edward, the first passenger vessel to be propelled by steam turbines. The vessels, King Edward, Queen Alexandra, The Queen, and the yachts Lorena, Emerald and Tarantula, were now in commission and had given entire satisfaction to the owners and the public. The engineering of larger vessels and liners was not a very long step beyond what has already been proved to be successful. The experience with the marine turbine up to 10,000 H. P. in ships of fast as well as moderate speed had tended to justify the anticipation guided by the theory that the larger the engines the more favorable will be the results as compared with reciprocating engines. The saving of weight, cost, space, attendance and up-keep would become still more marked with turbine engines of above 10,000 and up to 60,000 H. P., for which designs have been prepared.

The new Calais and Dover turbine steamer, The Queen, built here, is attracting much attention. The reliability and efficiency of the rotary motor has been established by two years' working on the Clyde of the King Edward and by last year's service of the Queen Alexandra, but greater prominence is directed to this application of the turbine in a vessel which forms one of the important links in the great chain of communication round the world. This interest was manifested on the trial trip when there were on board representatives of almost all nationalities and of all the great steamship companies. According to cross bearings taken by the captain, the boat steamed as much as 23.8 knots, but that was with the current. The mean speed between Folkestone and Calais was about 22 knots, the center screw running at about 450 revolutions and the two side propellers at nearly 500 revolutions. There is only one screw on the outboard shaft, experience having shown that this is the most efficient arrangement. The two double and two single-ended boilers were working under a forced draft of about  $\frac{3}{4}$  in. air pressure. The steam pressure was 150 lbs. At the high-pressure turbine on the center shaft the mean was about 125 lbs. A good vacuum was easily maintained. This is a feature of the turbine. The return trip from Calais to Dover was against a 2-knot current, and no attempt was made to run at full speed, but the time taken was only 62 minutes. One day last week the run was made in 56 minutes, and there is no question of 21 knots being traversed within the hour every day. As to coal consumption, the amount for the single run is about 6 tons, which is less than in the existing steamers. Vibration is practically absent and only at the stern. With such success there is likely to be a development of this system of driving ships. Already the Belgians are considering the propriety of ordering a vessel for the Ostend and Dover service.

#### BELFAST A GREAT SHIP BUILDING CENTER.

The visit of the Institution of Naval Architects to Belfast has called attention to what that city has done in ship building. In spite of the great natural difficulties, due to the absence of coal and iron on which Lord Glasgow commented in his address, Belfast during 1902 built nineteen vessels aggregating 157,464 tons, an amount greater than the whole output of mercantile steam tonnage of any other entire European state, save Germany. Of the total over 79,500 tons were launched from Messrs. Harland & Wolff's yard, and nearly 76,000 tons from Messrs. Workman & Clark's yard. Out of the seventy largest vessels afloat of 10,000 tons and upwards Messrs. Harland & Wolff have built no less than thirty-five of an average tonnage of 12,618. Size has always been a feature of this firm's work, and the three great ships, Oceanic, Celtic and Cedric (the largest vessels afloat), are examples of what modern enterprise and skill can do. To undertake the building of such vessels, and to be able to do so expeditiously and economically, advantage must be taken of every appliance that modern invention has perfected for the special class of work in view. Messrs. Workman & Clark's works have grown with great rapidity, and last year the firm launched twelve vessels representing 75,932 tons and 46,900 H. P.

#### GERMAN AND BRITISH SUBMARINES.

The German navy authorities have urged private ship building firms to consider anew the difficult problem associated with the design of a satisfactory type of submarine boat. The practicability of submarine boats even within limitations is still disputed, but there has been a great change in opinion as to the tactical advantage of such vessels from the naval point of view. Germany was the last of the first-class powers to be convinced. No experi-

mental craft yet produced has a fraction of the success reached by the Vickers boats. Very important improvements have been made since the first boats were completed by the Vickers company, and the nine boats now being laid down at Barrow-in-Furness, with an additional experimental boat, will excel anything ever attained in this difficult branch of naval architecture. Messrs. Vickers, Sons & Maxim are now putting down these nine new submarines for the British admiralty, and for this purpose they are constructing a special shed in order that the boats may be built in secret. Already nine submarines have been launched at Barrow for the British navy, and they have given such excellent results in their maneuvers in the Irish sea and the English channel that it is evident there will soon be a large increase in the number of this new type of war vessel. A tenth submarine, embodying some new experimental improvements, has also to be built at Barrow.

#### UNSATISFACTORY SHIP BUILDING RETURNS.

The ship building half year which ended June 30 does not compare favorably with the recent past in so far as the Clyde and Scotland are concerned. Our record for June is twenty-nine vessels of 29,885 tons, which brings up our total for the six months to 208,411 tons. This total compares with the corresponding periods: 1902, 259,804 tons; 1901, 246,752 tons; 1900, 232,584 tons; 1899, 250,310 tons; 1898, 227,608 tons; and 1897, 159,450 tons, so this half year is the worst since 1897. The next half year will be worse still, for though among the new contracts recently placed are a large intermediate Cunarder and (it is believed) one of the new 25-knot boats for the same line, and although one or two of the Port-Glasgow yards have booked several merchant craft this last week or two, none of these will appear in the current year's launches. The contracts reported in the month of June aggregate only about 17,000 tons in addition to the big Cunarder, and none of them of any special mercantile or marine importance. Nor is the prospect of cheaper material at the moment very bright. There is such a run upon pig iron just now that smelters will not abate prices, and without cheaper crude iron ship-plates and angles, etc., cannot be reduced.

The Arabic, latest addition to the Morgan combine fleet, has taken her place in the Liverpool-New York trade. The Arabic, with the Celtic, Cedric and Cymric, will run a second weekly service in the combine interest between Liverpool, Queenstown and New York and vice versa, sailing from Liverpool every Friday and from New York every Friday, while the Oceanic, Majestic, Teutonic and Germanic will run the mail service, sailing from Liverpool and New York on Wednesdays of each week.

#### WORK AT FORE RIVER.

Quincy, Mass., July 15.—A coppersmiths' shop with a ground area 49x73 ft. is being added to the equipment of the Fore River ship yard. The new building is alongside the fitting-out basin, and is planned to be extended along the dock as future needs may require. It will ultimately include a riggers' loft and a paint shop. The construction of the addition at the seaward end of the fitting-out dock is being pushed fast. The foundation piling has been set, and work on the concrete walls will begin at once. When completed the dock and the gantry crane tracks upon it will be 1,200 ft. long.

The steel conning tower for the battleship New Jersey has arrived at the ship yard. It is a single elliptical casting of 91,500 lbs. The shield that protects it weighs 11½ tons and the top nearly another ton, while fifteen of the bolts that fasten it together come to 35 lbs more, making the total weight of the structure about 115,330 lbs.

Rapid progress has been made on the Fall River line freight steamer. The frames are all in place now so that next week the shell-platers will be set to work, and the raising of the interior bulkheads begun. Over 300,000 lbs. of steel has been built into the hull already.

With her launching but a month away, the six-master William L. Douglas begins to show her true bulk, even side of the big battleships under the Fore River ship house. The hull plating is not completed, the frames still showing fore and aft, but the spar deck is laid and the forecastle and poop are closed in.

#### SHIP BUILDING ON THE PACIFIC COAST.

San Francisco, July 11.—The reorganization proceedings in the east in no way affect the standing of the Union Iron Works. This large plant has been leased from the United States Ship Building Co. and forms one of its solvent assets. The company leasing the plant is carrying on a large and profitable business that under no possible circumstances will be interfered with. All bills are being discounted and its affairs are being run on an absolutely cash basis. Good progress is being made in all branches of work.

At the yard of the Fulton Iron Works everything is bustle. A new tail shaft has just been completed for the steamer Santa Barbara. The machinery for the steamer Shasta, being built for E. K. Wood, is nearing completion. The boilers have been taken out of the wrecked steamer Progreso and installed in the Comanche.

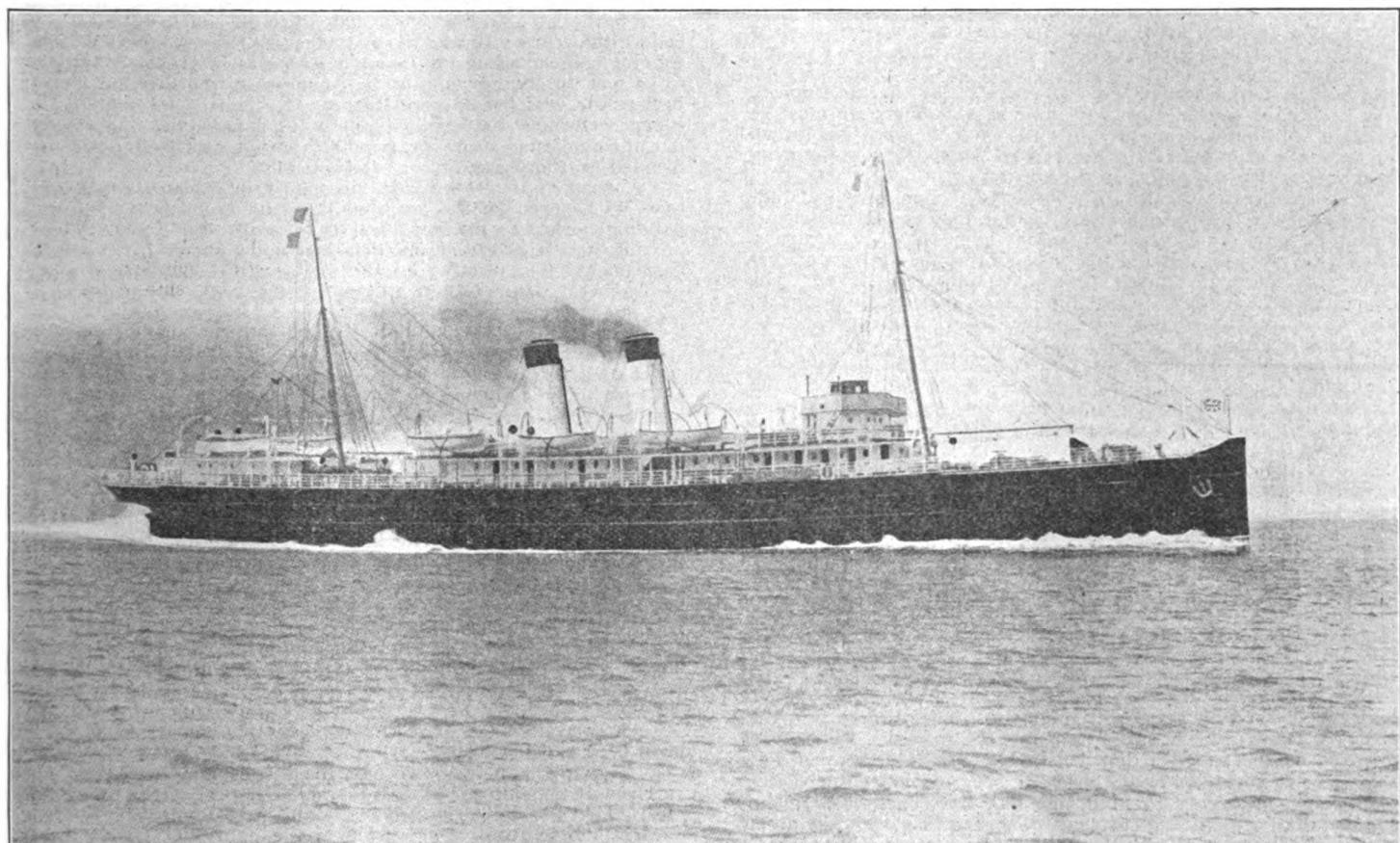
At the Risdon Iron Works the new ferryboat Ramona was completed during the week and given a satisfactory trial trip. The Ramona was built for the Coronado Beach Ferry Co. of San Diego. The Ramona cost \$75,000 and has accommodations for 800 persons.

### TURBINE STEAMER QUEEN.

On this page is a picture of the new turbine steamer Queen, which has already done so much to minimize the discomforts of the English channel service. The Queen has been completely described in the Review, so that only a brief mention may be made of her. She is 310 ft. long, with a molded breadth of 40 ft. and depth of 25 ft. She has a complete awning deck with deck houses thereon, and a number of special cabins provided for the convenience of passengers. The smoking room is amidships. Above the first-class accommodation there is a promenade deck extending out to ship's side, which shelters the awning deck in wet weather and provides a large promenade for passengers. The ladies' accommodation is in a large apartment on the main deck, framed in oak. Immediately below this is a gentlemen's sleeping saloon. Twelve staterooms and two royal staterooms are on the upper deck. There are three turbines—one high-pressure in the center of the ship and two low-pressure, one on each side of the ship. Each turbine drives a separate shaft, with one propeller on each shaft, three in all. Inside the exhaust casing of each of the low-pressure cylinders a reversing turbine is fitted. In ordinary going ahead the steam from the boilers is

for the reorganization committee, confirm the fact that, in concert with Alexander & Green, counsel for the trustees of the first mortgage, they had applied to the judges to be heard upon any such application, basing their action upon the ground, among others, that the New Jersey court was without jurisdiction to appoint a receiver, as had been contended before that court. That today the complainant, Conklin, and the receiver, through their counsel, Untermyer & Wellman, applied to United States Circuit Judge Putnam at Portland, Me., for the appointment of Mr. Smith as ancillary receiver in that district.

Judge Putnam refused the appointment of Mr. Smith as receiver upon the present application, saying that he would not make an order appointing a receiver under any circumstances except upon public hearing and after eight days' notice, but that, while he would not act upon the present application in its present form, he would express his present opinion, namely, that he was advised that Mr. Smith had been appointed receiver in this cause by Judge Kirkpatrick of the United States district court of New Jersey, who had based his action upon the existence of a statute of the state of New Jersey authorizing the appointment of receivers of corporations organized in that state in case of insol-



Turbine steamer Queen of the English Channel Service.

admitted through a suitable regulating valve to the high-pressure turbine, and after expanding about five-fold it passes to each of the low-pressure turbines in parallel, and is again expanded in them about twenty-five-fold, and then passes to the condensers, the total expansion ratio being 125-fold. Much of the advantage of the screw is lost on short voyages by delay in maneuvering, but the Queen has exceptionally good power in this respect. On her trial trip on the Clyde, when steaming continuously astern, she attained a speed of about 13 knots. Starting and stopping trials were also carried out, and the vessel, when going over 19 knots an hour, was brought to a dead stop in 1 minute and 7 seconds. The distance she traveled during this time was equal to only two and a half times her own length. She makes the trip from Dover to Calais in 1 hour and 8 minutes.

### ANCILLARY RECEIVER FOR SHIP BUILDING CO.

In the United States circuit court at Wilmington, Del., last week on the application of Roland B. Conklin of New York and other stockholders and bondholders of the United States Ship Building Co., Judges Gray and Bradford appointed James Smith, Jr., of New Jersey ancillary receiver for the company in the district of Delaware. It is the intention, if possible, to make Mr. Smith ancillary receiver in all the states in which the ship building company has plants. In the state of Maine the application to make Mr. Smith receiver was denied. Sullivan & Cromwell, counsel for the reorganization committee, gave out the following statement concerning it on Saturday last:

"Referring to the application of Receiver Smith, made through his counsel, Untermyer & Wellman, to have the receivership of Mr. Smith extended over the property of the several allied corporations in the different states, Sullivan & Cromwell, counsel

vency; but that in his, Judge Putnam's, opinion, the national bankruptcy act had abrogated all state insolvency proceedings. In his opinion, Judge Kirkpatrick was without jurisdiction to appoint a receiver under such circumstances. Counsel for Mr. Conklin urged the court to appoint Mr. Smith receiver, but Judge Putnam said the practice of extending receiverships had been so much abused that he was not at all sure that he would allow it. He did not say he could be induced to extend the receivership or to appoint an independent receiver, but he did say that one thing was sure—that he would not appoint a receiver unless some provision was made for the payment of all the receiver's obligations, as well as his compensation. In his opinion, if a receiver were appointed and bankruptcy proceedings were afterward instituted, the receivership would fail."

In view of the great increase in the number of warships which form Russia's Pacific squadron, the ministry of marine has decided to establish several dry docks in the far east. A dry dock is nearly ready for use at Port Arthur. A naval architect left Cronstadt recently for the far east, where he will make a round of inspection of the existing docks with a view to taking such measures as will make them capable of being used by Russian warships.

The high wind of Friday last caused the large hoisting tower on the dock of the Portage Coal & Dock Co. at Houghton to break from its fastenings and to crash through the boiler house below it. The dock company's superintendent at Hancock wired Pickands, Mather & Co. of Cleveland that the dock will again be ready to discharge vessels on Monday, July 20, with unloading capacity of 1,500 tons a day.

### LEAGUE ISLAND NAVY YARD.

Philadelphia, July 15.—A sub-committee of the congressional committee on naval affairs began a two days' inspection of the League Island navy yard last Friday and wound up its work Saturday. The committee consisted of Representative George E. Foss, chairman, of Illinois, A. G. Dayton of West Virginia, Henry C. Loudenslager of New Jersey, Sidney E. Mudd of Maryland, E. W. Roberts of Massachusetts, F. C. Tate of Georgia, John F. Rixey of Virginia and W. W. Kitchen of North Carolina. The committee left Washington July 8 on the Dolphin for an inspection of naval stations on the Atlantic coast. The Dolphin, dispatch boat, was under command of Lieut. Comdr J. H. Gibbons. The committee was taken in charge by Capt. Sigsbee, commandant of the League Island yard, upon its arrival there and a thorough inspection was made. A conference was also held, at which plans for the improvement of the yard were discussed. It was said that appropriations required for work proposed and for maintenance of the yard will aggregate \$1,000,000. After the conference Congressman Loudenslager of New Jersey said:

"League Island, I feel, is in my district, and I am anxious to see it made the leading navy yard of the country. No other yard can claim the advantages which League Island possesses, and yet it is hard to make members of congress, and especially those living at a distance, believe that. The way to convince them is to bring them here and let them see for themselves. Their eyes were opened when they saw the facilities of League Island, which have never been taken advantage of by the government. We cannot, of course, expect to develop it at once; we must be satisfied with building up little by little until the yard has grown to such proportions that the government cannot help recognizing it as the leading navy yard in the country."

The congressman carefully considered the improvements advised, and were unanimous in the opinion that the entire scheme should be carried out at as early a date as possible. Contrary to report the congressmen did not visit any of the Delaware river ship yards where government vessels are being constructed. The committee left Sunday afternoon for New York on the Dolphin, and will spend part of this week at the Brooklyn navy yard.

Capt. Charles D. Sigsbee, commandant of the League Island navy yard, believes that a great future awaits that yard. He predicts that it will become, if not the leading, one of the foremost navy yards in America and in the world. It has more ground than all the British naval dock yards together, and probably more than all the other American navy yards. Capt. Sigsbee considers the personnel of the enlisted men the chief drawback to raising the navy to a standard equal to that of the best European navies. He said upon the subject:

"The great difficulty in our navy is the personnel. If we can find a way to get our American young men into our navy and then keep them there, as the English and Germans do with their men, we will have accomplished as much as in the building of many warships. The English go in for long enlistments and their sailors are developed to a high state of efficiency. They are improved both socially and financially by their service and at the end of their enlistment they go into the naval reserve. The trouble with us is that the American-born citizen can do better both socially and financially on shore. Of those who go into the navy too many enlist with the romantic idea in view. When they do not find the romance they are disappointed and become dissatisfied. Just how we are to make the navy popular without giving enormous pay is difficult to answer. But I believe that the tone of the enlisted men is improving in every way. This is especially true of the petty officers." Capt. Sigsbee believes that apprentices and landsmen should be quartered in land barracks instead of ships.

Capt. Sigsbee is in no hurry to leave the League Island navy yard, but will probably be relieved of his post Aug. 10, when he will be raised to the rank of rear-admiral, succeeding Rear-Admiral Remey who will be retired.

### DELAWARE RIVER SHIP BUILDING NOTES.

Philadelphia, July 15.—At the New York Ship Building Co.'s works, Camden, on Saturday, the fire boat for New York City was launched, and the event was participated in by prominent officials of New York City. The vessel was christened by Miss Mary Thompson, daughter of Frederick Thompson, superintending engineer of the New York fire department, and was named Abram S. Hewitt in honor of a former mayor of New York City. The keel of the fire boat was laid June 11. Her dimensions are: Length, 117 ft.; breadth, 24 ft. 6 in.; molded depth, 13 ft. 4 in. She is a single screw vessel and will have a speed of about 12 knots. She will have three sets of fire pumps made by the American Steam Fire Engine Co. of Seneca Falls, N. Y., with a capacity of 7,200 gallons a minute. The boat will be turned over to the New York authorities within a month. The keel of a second fire boat for New York will be laid sometime this week.

The steamer Charles W. Morse, built by the Harlan & Hollingsworth Co., Wilmington, for the People's Line, New York, was also launched Saturday. Miss Anna Bell Engles, daughter of the president of the People's Line, being sponsor. The extreme length of the Morse is 430 ft. and her beam over guards is 96 ft. There will be three tiers of state rooms, all outside rooms. The main dining room is to be unusually spacious and will seat 300 people. Her engines are of about 4,500 H. P.

At the Neafie & Levy ship yards work has started on the

four tugs recently contracted for, to be built for the United States quartermasters' department. The boats are to be used in the Atlantic coast service. The Neafie & Levy company is also to build a new quarantine vessel, ordered by the state of Pennsylvania. It is to cost \$35,000 and will be named the Governor Pennynacker.

### NAVAL NOTES FROM NEWPORT NEWS.

Newport News, Va., July 15.—It is hoped (probably without good reason, however) that the visit of members of the committee on naval affairs of the last congress to the navy yard will result in a larger expenditure by the next congress for improvements. Just where authority for this trip on the U. S. S. Dolphin comes from no one seems to understand, as no committee now exists, but those who visited the navy yard were greatly impressed with its importance, and if the result of the inspection is improvements at the Norfolk station there will be little worry in this neighborhood as to who authorized the trip. It is understood that the armored cruiser New York, which will have repairs made to the extent of \$500,000 and will receive a new \$500,000 battery, will be sent to this yard to have the work done. The committee went from Hampton Roads to the navy yard at League Island.

The board of construction and repair of the navy does not believe the cruiser Topeka, now attached to Rear Admiral Wise's training-ship squadron in Hampton Roads, is in proper condition to be sent on another long cruise. Officers of the ship, however, declare the vessel is in good shape. Her boilers are said to be somewhat leaky. Secretary Moody will not order the ship placed out of commission at present for the extensive overhauling recommended by the board of construction.

A quantity of Harveyized casemate armor plate—about 420 tons—to be used on the cruisers Maryland and West Virginia, building here, was tested several days ago at the Indian Head proving station, pronounced satisfactory and accepted by the navy department. The tests were unusually severe. The plate is 5 in. in thickness. No cracks at all resulted from any of the impacts.

The cruiser Topeka has been engaged for some days in wireless telegraphy tests outside of the Capes. The ship is equipped for long-distance work and has met with excellent results. It is stated that the efficiency of the wireless telegraphy system that has been adopted by the government for use between ship and ship has been demonstrated by the experiments on the Topeka and the Prairie.

The training ships Monongahela and Alliance left the training-ship squadron in Hampton Roads to-day and sailed for Frenchman's Bay, Me. Admiral Wise transferred his flag to the Yankee temporarily from the Alliance. The Yankee, Prairie and Topeka came here today for coal. The Arkansas, which is in the Roads and is under Admiral Wise's command, may be ordered to the ship yard here, where she was built, to have the rollers of her 12-in. gun turret replaced with stronger apparatus.

The German cruiser Gazelle, Count von Oriola in command, has returned to the ship yard for additional repairs and overhauling. The German gunboat Panther is still here and will not leave for a week yet. She was recently sent to sea to test her battery.

Two car loads of the machinery for the cruiser Galveston have been shipped to the navy yard preparatory to the dispatch of the Galveston there from Richmond for completion.

The refrigerating ship Glacier of the navy, which has just returned to the navy yard from Manila, will be overhauled and about \$100,000 will be spent on her.

A new lighthouse will be built in Hampton Roads between Willoughby spit and Newport News middleground light.

### AROUND THE WORLD TRIPS.

The movement recently started to establish direct connection between transatlantic lines and transcontinental railroads will make it possible to travel around the world at express speed, or in about forty-five days. At the present time, although there are various routes for touring the world, there is no connected service, as the railroads and steamship lines make no pretence to observe a common time table. While one may travel around the world now in forty-five days' actual traveling, it takes sixty-three days owing to lack of prompt connections. This trip is made via the Cape of Good Hope and Cape Horn and works out at an average of 16 knots per hour, a very fair sea speed. The competition for the shortest world route is virtually restricted to two main routes. One, controlled by the Canadian railroad and an English steamship line, offers a service of fifty-two and a half days. This service contemplates twenty-four days to or from Hong Kong eastward, seventeen and a half days from Hong Kong to Vancouver, and eleven days from Vancouver to London. The other route is of recent origin. It includes the Siberian railway and the Great Northern railway, so that a great part of the trip is made overland.

Directors of the Rickmers Rice-Milling, Ship-Owning & Ship-Building Co. of Bremen intend to build several new vessels at their own yard within the next three years, and to bring the fleet up to about thirty steamers and sailers besides ocean lighters and barges, all of which tonnage will be employed chiefly in the rice trade. A pension fund for employes and their families will, in the meantime, be established. The keel of one of the new vessels (6,000 tons) will be laid down next month.

### SUPERVISING INSPECTORS ABOUT DONE.

Washington, July 15.—With the ending of the current week the board of supervising inspectors of steam vessels will have completed their arduous task of rejuvenating and bringing up to date the rules and regulations governing this important branch of the government's service. Their recommendations will be laid before Secretary George B. Cortelyou of the department of commerce and labor, of which the inspection service is a part, for his approval. When approved, as they very probably will be, congress will be asked to pass upon them.

For two months the members of the board have labored faithfully and doggedly at the task which they have now about completed. Day and night the members, either in attendance on a board meeting or else engaged in committee work, have struggled with the old, worn-out rules and regulations, giving new vigor to them, striking out here and inserting there in order to formulate regulations which they hope will meet the advanced condition of the country's commerce, both inland and on the high seas.

In main, the workings of the board have been harmonious. Their task, as required by law, is one of secrecy and for the member of the board who violates this injunction the legal penalty is dismissal. This question of secrecy stirred up quite a hornet's nest during the past week. Announcement was made in the public press—the source from which the announcement came has not been ascertained—that the secrets of the board had been divulged by Inspectors John D. Sloane of Dubuque and Ralph J. Whitledge of St. Louis. The story continued:

"James Stone, supervising inspector of the ninth district, with headquarters at Cleveland, who has also been mentioned in connection with the leakage, is exonerated from all blame. Secretary of Commerce and Labor Cortelyou and Supervising Inspector General Uhler held two lengthy conferences about the matter. It was determined that the charges of telling the board's secrets should be investigated. Messrs. Sloane and Whitledge deny absolutely that they have been guilty of talking too much. Sloane is specifically charged with having communicated news of the deliberations of the board to certain interested persons in Dubuque and elsewhere. He is said to have conferred with Admiral Melville, chief engineer of the navy, and John W. Collins, chief of the United States revenue cutter service, about certain mathematical and scientific problems with which the board of supervising inspectors has had to deal. Sloane has advanced certain ideas before the board, accompanied by the statement that they had the approval of Melville and Collins. The right of Mr. Sloane to talk with Melville and Collins about the workings of the board is denied by other members of the board. R. J. Whitledge has advocated certain plans concerning the regulation of the service which have not met with the approval of the other members of the board. Because this approval was refused, he is charged with having written to people in St. Louis, who are interested in the service, urging them to come to his support. As a result of this, steamboat owners and others affiliated with them have written numerous letters to members of the board of supervising inspectors and to the secretary of commerce and labor, urging them to make certain modifications in the rules governing the service, as recommended by Mr. Whitledge. Section 4410 of the revised statutes prohibits any supervising inspector from telling what occurs during a meeting of the board of which he is a member. Violators of this provision cannot be prosecuted, but they can be punished by dismissal. Being presidential appointees, Sloane and Whitledge cannot be dismissed except by the president, either with or without the recommendation of Secretary Cortelyou. Both were appointed by McKinley."

General Uhler, when his attention was called to the story, characterized it as the work of some one maliciously inclined. He said: "The story is untrue in every particular; without foundation of fact, and the first I knew of any charges was the publication of them. I have never had any such matter called to my attention and there is nothing to it."

The impression has gained ground that some one connected with the board had an axe to grind in the way of revenge on the gentlemen named and was the father of the yarn.

The report of the board, which will be laid before Secretary Cortelyou in about three weeks, is a mountain of papers that mean hours of agony for government typewriters. The perusal of the report will engage Secretary Cortelyou's attention for at least two weeks, and not until he has gone thoroughly over it and duly signed it will a single change in the existing laws be made public.

### GERMAN LOAD LINE.

The advisability of marking an official load line on German merchant vessels, after having been the subject of much controversy in recent years, has now been admitted in principle. Hitherto every German ship owner has been at liberty to load his vessel according to his own judgment, except when taking cargo in a British port, in which case they are subject to the British Board of Trade regulations. "The fact that these regulations have not been copied and adopted in Germany," says Fairplay of London, "seems to prove that German ship owners consider that they do not in their entirety suit all the different types of vessels nor the circumstances of the shipping trade of these times. Nevertheless discussions have been held and measures taken with a view to obtain evidence on which might be based the determination of an official load line. At a meeting of the Seeberufsgenossenschaft (Mercantile Marine Federation) on May 26, 1900, it was re-

solved that steps should be taken for supervising the draught of all sea-going vessels, except those engaged in the lesser coasting trade, the fisheries, and the pleasure and towing services. Every ship owner was then called upon to make arrangements for ascertaining the greatest draught to which each of his vessels was loaded on every separate voyage, and to cause this information to be forwarded to the managers of the Seeberufsgenossenschaft, together with such particulars respecting the nature and condition of the cargoes carried and the mode of their stowage as might serve for the formation of a safe judgment as to the proper draught of the vessel. This information was subsequently handed over to the Germanischer Lloyd, with the request that, if possible, suitable regulations for governing the greatest draught (or the smallest freeboard) of German vessels should be drawn up. A code of rules and a set of tables have accordingly been compiled, based on the observations and practical experience of the last few years. Two tables are provided for steamers—one for full-deck vessels and one for storm-deck vessels—but there is only one table for sailing ships. As regards steamers, the rule is laid down that they shall have a double bottom, but sailors are not required to be so provided. The tables show (subject to correction on account of deck erections) what should be the freeboard of all types of vessels, and rules are drawn up to show to what extent the freeboard may be reduced for fresh-water navigation, and how that of steamers must be increased for winter voyages. Special regulations for timber-laden ships are to be formulated later on."

### EUROPEAN IRON TRADE.

The London Coal and Iron Trade Review observes that while the general tone and condition of the British iron trade in 1903 have been unusually satisfactory, continental iron interests have not had much to complain of. This is more especially true of Germany, which has increased its exports for the first four months of 1903 by 246,332 tons, or 26.52 per cent., against an increase of 57,675 tons, or 32.28 per cent., in the case of Belgium, and an increase of 26,068 tons, or 17.47 per cent., in the case of France. These three sets of figures, taken together, make a total of 330,075 tons, which is the gross increase of the three countries in the first four months, and which compares with an increase of 261,490 tons in British exports of iron and steel for the same period. The German exports for this period have been at the rate of 3,525,000 tons a year, which is much in excess of the corresponding German exports for any previous year. The German increase for the first four months of 1903 has chiefly appeared in pig iron, general merchant iron, rails and unwrought steel, which compare as under, the figures given representing tons:

	1902.	1903.
Pig iron .....	93,948	171,533
General merchant .....	231,357	254,216
Railway material .....	101,186	168,555
Unwrought steel .....	156,022	241,979

The exports of the principal countries from Germany and Belgium, respectively, have been as under for the first four months:

	From Germany.	Belgium.
Great Britain .....	283,818	37,342
United States .....	129,883	28,628
Holland .....	135,555	17,581
Italy .....	36,233	....
Scandinavia .....	53,810	2,567
China and Japan .....	41,792	22,012

The exports of the two chief continental iron-shipping countries to Great Britain and her colonies, in the same period, so far as the particulars can be stated, are as under:

	From Germany.	Belgium.
Great Britain .....	283,818	37,342
India .....	34,499	15,196
Australia .....	11,948	1,590
The Cape .....	2,113	2,013
Egypt .....	.....	3,283
Canada .....	17,814	.....

The call of J. P. Morgan & Co. for the remaining installment of 10 per cent., or \$5,000,000 of the \$50,000,000 subscribed by the International Mercantile Marine underwriting syndicate, to be paid in not later than July 31, attracted a good deal of attention in Wall street. The preferred stock declined to 19 1/4 and the common to 4 1/4. The final call for the \$5,000,000 means that the syndicate is to take \$5,000,000 more of the bonds, making the total issued thus far \$50,000,000. The amount authorized is \$75,000,000. It is understood that a considerable part of the new capital is needed to pay for new steamships in course of construction, of which there are ten altogether, having been contracted for by the subsidiary companies before the shipping combination was formed. Four of these ships are being built at Sparrow's Point and six at Belfast.

The annual meeting of the Lake Superior Mining Institute will be held on the Marquette range, beginning Aug. 18. The committee on arrangements consists of M. M. Duncan, Walter Fitch, W. H. Johnston, D. T. Morgan, Thomas Walters, James Clancy, Alex. Maitland, A. J. Yungbluth, George A. Newett and Samuel Mitchell.



### IRON MINING MATTERS.

Duluth, Minn., July 16.—A very pretty legal difficulty is approaching on the Mesabi and Vermillion iron ranges. The state of Minnesota and its lessees are on one side and the fee owners of land around lakes on the other. It has been acknowledged as a principle of common law that the riparian ownership of meandered lakes carries with it any rights of ownership of land under water that could be held for private use, other than theinalienable rights of the public. Acting on this idea no land under water has ever been leased for mining purposes except by the owners of adjoining lands. But now comes the state auditor and gives to private applicants mineral leases upon lands under water that are entirely surrounded by fees held by individuals and companies. The state, in other words, claims to be by virtue of the swamp land act owner of all land under water, up to the shore line, and as such is to dispose of these tracts. It may be that many millions of value lie in these lands. Some of them are well located on ore-bearing formations. One lease has already been granted and applications are in for thirty more. Fee owners will contest the leases and will treat any who cross their lands to explore under these lakes as trespassers, so that it will be very difficult, in many cases, to reach the lakes.

At the Shenango mine on the Mesabi range they are lowering a great pumping plant and will open into their ore body as soon as the pumps are ready. To open now would flood the shaft. This mine has been in process of development for more than a year. Three shafts have been sunk. The first two were abandoned because of the tremendous inflow of quicksand and water, and the third was sunk all the way in rock. At its foot two drifts have been driven to the ore, but it has not been cut into for fear of an enormous flow. When the pumps are ready the drifts will be shovelled ahead and the great basin drained. The mine is under a vast swamp and bids fair to be one of the wettest properties in the lake region. It has so far 20,000,000 tons of good ore shown and is not yet thoroughly developed. Its owner got the mine, then waste wild land, on the foreclosure of a \$500 mortgage. He had loaned a rascally homesteader \$500 on the security of pine he was led to believe stood on the tract. But no pine was there, and the homesteader after getting his money never appeared to pay interest or principal. It was an irony of fate that the land foisted ten years ago on the present owner for \$500 should now be worth to him \$5,000,000 in royalties alone. Whether the original homesteader, who thought he was making a splendid sale when he got \$500 for a mortgage on this rich land, is dead or alive no one knows. He has disappeared completely from human view.

The Wisconsin & Michigan road opened traffic to Menominee range points this month. It will not be in condition to care for ore until next spring, but will erect a large ore dock at Escanaba the coming winter and will make a bid for ore business. It is controlled by ex-Congressman Stephenson of Michigan.

The Caspian and Verona mines of the Buffalo Steel Co. are improving in appearance as depth is attained and they bid fair to be large and good properties. Adjoining the company's Baltic, on the same range, ore has been found on what are known as the "McKinnon lands," and a shaft will be sunk there shortly. The same company is operating the Young exploration and is reported to be making excellent progress there.

Explorations are under way on the Menominee range for the Thomas Furnace Co. of Milwaukee, on lands that give good promise, but on which nothing of value has yet been discovered.

The Pitt Iron Co., affiliated with the La Belle Iron Works of Steubenville, Ohio, is busily engaged in opening a mine in 4-58-15, where it has a lease on some 2,000,000 tons at a royalty of 35 cents a ton. A shaft is being sunk and buildings are going up.

The Foxdale mine at Humboldt has closed, but is being kept free from water and it is rumored is being inspected with a view to purchase by a steel-making interest.

### BUFFALO ELEVATOR SITUATION.

Buffalo, July 15.—There is a new interest in the elevator situation just now on account of the several sides there are to it—never so many before. In the days of the "Pirates of the Termini"—wonder if the inventor of that immortal phrase received the reward he merited—it was strictly all one thing. Even then there was a side enterprise revived once in a while by which a new floater was set up to be bought in by the pool to get it out of the way. But those days are afar off now, never to return. At the foot of Main street, to begin the week, there was an interesting object lesson furnished by fate in the shape of the old Lyon elevator being torn down because it could not catch on the procession, and next to it the Richmond, also an idle piece of property for a long time, but again one of the most active houses

in the harbor just now because the pool would not come down as it used to and elevate canal grain for nothing.

But the problem is not solved yet. The Kellogg, which has all the season made a canal rate equal to half the pool rate of a half cent a bushel, is now rumored to be preparing to elevate this grain free again. This elevator is an exceedingly free lance and has somehow managed to hold its own against the pool several seasons, and is said to be making money. If it should now take grain free it might drive the Richmond out of business, and if the pool should follow there would then be no direct elevator charges at this port, so far as the grain is concerned, unless it be for strictly local grain, as the roads now absorb the charges so far as they are concerned.

Of course there is a shoveling charge all 'round that all the elevators stick to very tenaciously, as more than half of it goes to the scopers. It may happen some day, if this charge does not stop mounting up, that the vessels, which now have to pay it, will come to an understanding with themselves and provide their own apparatus for feeding the elevator leg, and then the business would be on a new basis decidedly. As it is there are so many new elements of distraction in the business that any sort of combine is sure to be pretty weak. The railroads do not care much for a pool and the shippers who control their own elevators are about equally indifferent, while the canal is made to stand on its own foundation whether it will or not.

What a world of waste there is, not only in the world at large, but in the same dooryard. With the Lyon elevator coming down on one side of a slip there is a new one going up right on the next slip a few rods away for the Washburn-Crosby flour mill. Of course the old elevator could not be used for the new concern, but if it only could, what a saving! Still it is some enterprising foreigner who has said that we Americans are going ahead so much faster than most nations because we know the value of the scrap heap.

Just about twenty-two years ago the first electric subways were built in Buffalo, for the old Thompson-Houston company, and the wire cables were buried in solid cement, never to be getatable for repair or examination. They are there of course yet. The other day New York city electricians declined to bid on some new electric work against Buffalo because it was confessed that the metropolis was not electrically as far advanced as this city was. If it had been the plan to use old subways or old elevators after better ones were in sight this tribute would hardly have been made to us.

Well, there are more changes affecting this port as a grain center that will have to be looked after. The St. Lawrence route is doing more business than it has done for a long time, partly because there is a new American line of steamers trying hard to bring it to the fore and partly because the canal tolls are off, a policy that the steamer company had a tip on long before other people thought of it. It is found that the up-bound coal traffic, all from Oswego so far, is dividing this benefit about equally between the shipper and the vessel, which is much as it should be. Buffalo is watching this route with about as much interest as any section and is still able to report that grain receipts are fully a third more than they were last season. Private advices from Chicago have it that there is a great amount of corn to come forward this fall if the market is favorable, and if it does there will be a new revelation regarding the St. Lawrence route. Can it take grain that Buffalo wants? That is the question. If it can in much quantity it is time the Erie canal enlargement was made a fact and no delay.

We hear of no weakening in the faith that the canal will be voted this fall, even if Rochester would like to bite her nose off to spite her face—that is Buffalo.

JOHN CHAMBERLIN.

### NAMES OF NEW GILCHRIST STEAMERS.

Mr. J. C. Gilchrist has decided upon the following names for eight steel freight steamers, all of the largest class, under construction at works of the American Ship Building Co. in Chicago, Lorain, West Bay City and Superior: No. 611 at West Bay City, F. W. Gilchrist; No. 612 at same place, J. L. Weeks; No. 62 at Chicago, R. L. Ireland; No. 63, same place, Perry G. Walker; No. 326, at Lorain, Lewis Woodruff; No. 327, same place, R. E. Schuck; No. 328, same place, J. C. Gilchrist; No. 417, at Superior, H. S. Sill.

Mr. Ireland, for whom one of the vessels is named, is vice-president of the ship building company. Mr. Sill is of the firm of Worthington & Sill, insurance agents, Buffalo. The other names are those of stockholders in the Gilchrist company. The Gilchrist fleet already has wooden vessels named R. E. Schuck and J. C. Gilchrist. The names of these wooden vessels will, of course, be changed before the steel steamers bearing the same names go into commission.

### CHICAGO GRAIN SITUATION.

Chicago, July 15.—Most of the vessel men are of the opinion that the reduction in grain freights to 1½ cents Buffalo corn basis is temporary. Receipts of grain have been increasing somewhat but the vessel supply early this week was just enough in excess of requirements to cause the drop in rates. Still the line boats are quite well booked, and unless the ore interests fail to take the "wild" vessels as freely as they have been taking them thus far a return to better grain freights may be looked for. Speculative features are still against any satisfactory activity in the eastern movement. Comparatively light stocks and a slow movement of old grain from western points are very strong factors in support of present prices. On the other hand, crop reports are very favorable and there is therefore as much hope as ever of a heavy movement a little later on. Port Huron and Georgian bay are on the 1½ cents corn basis, with Lake Ontario nominally at 3 cents corn. Through rates via Quebec and Ogdensburg lines figure about 4½ cents on corn, and this explains the dull condition of the Kingston market. The rate at and east of Kingston being about 1½ cents a bushel leaves only about 2¾ cents for the Kingston lake carrier. Shipments, lake and rail, are:

	Week just closed.	Last week.	Same week last year.
Wheat, bu.	655,623	211,500	567,095
Corn, bu.	2,291,195	1,464,035	1,332,464
Oats, bu.	1,009,397	715,624	1,340,200
Total	4,559,215	2,391,159	3,239,759
	Since Jan. 1, 1903.	Same time last year	
Wheat, bu.	11,192,453	14,823,296	
Corn, bu.	41,864,363	18,612,739	
Oats, bu.	35,120,400	29,027,916	
Total	88,183,276	62,463,951	

Stocks in elevators again show some gain. The figures on this score follow:

	Week just closed.	Last week.	Same week last year.
Wheat, bu.	3,965,000	4,276,000	3,065,000
Corn, bu.	8,627,000	7,340,000	5,014,000
Oats, bu.	1,992,000	1,765,000	324,000
Rye, bu.	322,000	203,000	102,000
Total	14,906,000	13,584,000	8,505,000

### PRACTICALLY NO GRAIN AT DULUTH.

Duluth, Minn., July 15.—There is almost no contract grade wheat at Duluth—Superior, only about 50,000 bu. The total wheat stocks are only 1,200,000 bu., of which four-fifths is No. 1 hard and "special bin." A considerable buying movement for eastern mills has developed the past week, and cash wheat for immediate grinding is bringing a premium of 8 to 9 cents a bushel over September. Sales of this wheat are at prices that make it cost, out of elevator at Buffalo, about 89 cents. This is the highest price for a long time.

It is now expected that the steel and tile elevator and storehouse to be built at Port Arthur for the Canadian Northern road by Barnett & Record will have a combined storage of 5,000,000 bu. This is generally believed to be the largest capacity in the world in one working house and annex, but the Feavey Duluth Terminal on Rice's Point, Duluth, has 5,250,000 bu. capacity in a wood working house and concrete annex.

### MORGAN AND ROCKEFELLER.

New York newspapers are trying to make out that there is much coolness between John D. Rockefeller and J. Pierpont Morgan and that the Standard Oil magnate proposes to "break" the financier. Mr. Walter Wellman of the Chicago Record Herald is the latest to give currency to this report. He says in the columns of his paper:

"Nevertheless and notwithstanding there are plenty of well-informed men who believe Mr. Rockefeller has a grudge against Mr. Morgan, which he intends to pay off at the first good opportunity. I am told by a man who is in position to know whereof he speaks that Mr. Rockefeller has never approved of Mr. Morgan's promotion enterprises. He particularly disapproves of the steel trust, and in forming his opinion jealousy over the creation of a greater industrial concern than the Standard Oil Co. played a natural part. Mr. Rockefeller is a man who lives a good deal within his shell. He is not communicative even to his familiars. But in divers ways he has permitted it to become known that he is opposed to wild-cat promoting, and that he regards Mr. Morgan as the chief offender in that line. It is known to everyone that a year or so ago, while Mr. Morgan was still in his reorganization fever, Mr. Vanderlip made an address before a bankers' association, in which he pointed out the danger of manufacturing too many securities without adequate property behind them. Mr. Vanderlip aimed his blow at Mr. Morgan, and from that day to this the wise men of Wall street have known that there was a coolness between the greatest man of money and the greatest financier on the American continent."

It will be of course news to those in the lake region that Mr. Rockefeller disapproves of the Steel Corporation. This is very odd, indeed, for without Mr. Rockefeller's sanction the Steel Corporation could not have been formed. In the Steel Corporation's

last annual inventory its iron ore assets were placed at \$700,000,000. Nor was this estimate of ore in the ground any too high. It is easily worth at current prices the sum mentioned; and if no new deposits are found it is going to be worth a great deal more. The most valuable of these deposits were turned over to the Steel Corporation by Mr. Rockefeller, who took stock in the corporation for them. This doesn't look as though Mr. Rockefeller regarded the corporation as hostile to his interests. As a matter of fact Mr. Rockefeller is the largest single owner of Steel Corporation stock. Possibly he may have been selling some of it lately, but that does not of itself signify anything. Big interests are constantly liquidating desirable holdings for a variety of reasons.

### CANADIAN MARITIME NOTES.

Capt. Walbran has been retired from the Dominion cruiser Quadra and has been succeeded by Capt. C. Hackett.

The Colonial Portland Cement Co. has prepared plans for the construction of a dock and landing pier at Colpoy's Bay, Ont.

The Dominion Atlantic Railway Co. has transferred the offices of its steamship lines from Boston, Mass., to Yarmouth, N. S.

A fine of \$25 has been inflicted on Capt. Murray, of the steamer Devona, for unnecessary whistling while passing Quebec.

Capt. McGregor of Goderich, Ont., late of the Dominion steamer Bayfield, has been voted a gratuity of \$1,050 by parliament on retiring from the service.

The Quebec Steamship Co. has purchased the British steamer Allandale for its New York, West Indian service, to replace the steamer lost at Bermuda, a few months ago.

Capt. Fraser, the new marine superintendent of the Montreal Transportation Co., has moved to Montreal from Sydney, N. S., and is on a trip from Montreal to Port Arthur.

It is reported in Halifax, N. S., that the Canada-Atlantic and Plant Line will build a new steamer for the Halifax-Boston run. If ordered the steamer will be built in Scotland.

The Dominion parliament has passed an act authorizing the city council of Winnipeg, Man., to carry out certain works for the ensuring of t.e navigation of the Assiniboine river.

The Dominion government steamer Eureka sank at her moorings Sorel, Que., and has since been floated. The Eureka has been used to demonstrate the brake invented by A. J. Lacoste.

The Canadian tug Davis, owned by W. Davis & Son, Ottawa, was seized at Ogdensburg, N. Y., in connection with the claim of the owners of the steamer Dean, for damages caused by a collision.

The Bark Antrope Co. (Ltd.) and the Contli Shipping Co. (Ltd.) have been incorporated under the British Columbia companies' act to do a general navigation business with headquarters at Vancouver, B. C.

Crockett & Blum of Forsyth, Man., are having surveys made of the Saskatchewan river from Edmonton, Sask., east and west, with a view of ascertaining the class of steamer that may be most profitably built for river use.

Capt. Bray of the barquentine Kremlin of Boston, Mass., has been presented by the Dominion government with a gold watch and chain for services rendered the crew of the barquentine May of Lunenburg, N. S., in September, 1901.

A Hamilton syndicate is negotiating for the purchase of a turbine steamer in Scotland, for use on the Toronto-Hamilton run. The Hamilton Steamboat Co., it is reported, contemplates selling the Macassa and ordering a new steamer.

The Richelieu & Ontario Navigation Co. have placed the steamer Virginia on the Saguenay run. The Virginia, which was formerly the property of the Baltimore Steam Packet Co., has been entirely refitted at the R. & O. docks at Sorel.

The Easton Steamboat Co. has been incorporated under the Dominion companies' act with offices at Quebec, and a capital of \$10,000 to carry on a general navigation and wrecking business in Canada. The incorporators are W. Easton, I. B. Easton of Albany, N. Y., L. A. Taschereau, C. E. Taschereau and L. A. Cannon of Quebec.

The Huntsville & Lake of Bays Navigation Co. has placed its new steamer Maple Leaf in service. The steamer is 56 ft. long, 11 ft. beam, and is fitted with fore and aft compound engine, cylinders 6 and 12 by 10-in. stroke. The company has plans ready for a larger steamer which it is proposed to construct during the winter. The company operates on the Lake of Bays and connecting waters of Ontario.

The Canadian Northwest Steamship Co. has been incorporated under the Dominion company's act to carry on a general navigation business on the inland waters of Canada and on the high seas. The capital is fixed at £250,000 and the offices are to be at Port Arthur, Ont. The incorporators are G. T. Marks, H. A. Wiley, F. S. Wiley, G. M. Murray of Port Arthur, Ont., and H. Cassells, K. C., of Toronto.

The steamer White Star, owned by the Oakville Navigation Co., Ont., was burned to the water's edge at Toronto, July 11. The steamer is valued at \$40,000, and she is insured for \$25,000. The White Star had only just come out from the yard of the Polson Iron Works, Toronto, after being repaired at a cost of \$5,000, and was being got ready to resume her run between Toronto and Oakville. It is expected that the company will order a new steamer for the service, though nothing has been definitely decided.

Capt. John W. Shackford, marine superintendent of the International Mercantile Marine Co., is seriously ill at one of the Philadelphia hospitals. He suffered two paralytic strokes.

### STORMS OF THE GREAT LAKES.

"Storms of the Great Lakes" is the title of a collection of meteorological charts issued by the weather bureau. They present graphically the more important storms of the great lakes that have been described in the monthly weather review during the twenty-five year period from 1876 to 1900. Each storm is illustrated by four charts that cover thirty-two to forty-eight hours of its history, and as a rule at least two of the charts present general meteorological conditions that obtained over the United States and Canada at observations taken eight and twenty-four hours before the storm center reached the lake region. The standard of intensity observed in selecting the storms varies with the seasons; the object has been simply to present typical lake storms of the various months that have been of sufficient strength to endanger shipping. A classification of these storms with regard to types and a study of the characteristics and relative seasonal frequency of the several types will, it is believed, be of interest and value to all persons interested in lake navigation, and the official forecaster will find that the charts present a record for steady reference that can be used to advantage in his daily work. The charts are so arranged that they can be filed in the form of a card index.

November, with a total of forty-five severe storms in twenty-five years, is the month of greatest storm frequency on the great lakes. October, November and December have each an average of more than one and less than two severe storms. Next in order come September and March, with twenty-three and twenty-two storms, respectively. In June and August severe storms occur about once in three years and in July about once in four years. It appears from these figures that as the season of navigation approaches its close the storms increase in number and also, as a rule, in severity, and that, as a forecasting feature, the severe straight gales of summer are an almost negligible quantity.

The most destructive storms of the great lakes come from the southwest. As a rule storms of this class first appear in the region that embraces the southeast slope of the Rocky mountains, the Rio Grande valley, the coast districts of northeastern Mexico and the west part of the Gulf of Mexico. They appear at times to have their origin in an atmospheric eddy that is formed over the region referred to by the meeting of warm, moist winds from the Gulf of Mexico and cold north to northwest winds that blow down the eastern slope of the Rocky mountains. In some instances storms that appear on the southeastern slope of the Rocky mountains are clearly secondary developments to areas of low barometric pressure that are moving eastward in northern latitudes. In the late summer and early autumn months storms from the west part of the Gulf of Mexico are sometimes of West Indian origin. Occasionally storms advance from the southern California coast over the southern Rocky mountains and the Rio Grande valley, and it is believed that they sometimes pursue a more southerly course from the Mexican Pacific coast to the Rio Grande valley. The season of southwest storms extends from October to May; those that advance from that region during the warmer months are usually of tropical origin. The approach of storms of the southwest type is generally indicated in the lake region twelve to twenty-four hours in advance of their arrival by falling barometer and east to northeast winds. As the storm center approaches the middle Mississippi or Ohio rivers the barometer falls rapidly and the wind gradually increases to gale force. Following the passage of the storm center the wind shifts suddenly to northwest and the barometer rises rapidly. The gales that attend these storms are particularly dangerous on the United States side of the great lakes where they come as onshore winds, and in the winter months the danger is frequently added to by heavy falls of snow and subsequent intense cold.

Next in order as regards severity are storms that advance from the states of the lower Missouri valley over the great lakes. These storms first appear on the middle-eastern slope of the Rocky mountains and move north of east, or swing southeastward from the northwestern states or the north Pacific coast and recure east and north of east over the lower Missouri valley or the states of the middle west. They frequently develop dangerous strength while crossing the lower Missouri or upper Mississippi valleys, and this is especially true of storms that advance from the northwest, recure north of east over Iowa, and pass thence over the lake region. At times this development is so sudden that alertness on the part of the forecaster to detect the conditions favorable to an increase in intensity and promptness to act on the part of that official is necessary to forewarn lake interests of their approach. Storms of this class are also attended during the colder months by snow, but the snowfalls are not, as a rule, so heavy as those that attend storms from the southwest. The approach of storms from the lower Missouri valley and the middle west is generally indicated at points on the great lakes twelve to twenty-four hours before gales begin by east to southeast winds, falling barometer, fleecy upper clouds moving from a westerly direction that gradually become obscured by lower clouds that move, with increasing velocity, first from the south and later from the east quadrants. When the barometer begins to fall rapidly and the wind freshens and shifts to easterly points no time should be lost in seeking shelter by vessels that are liable to be damaged by easterly gales. Following the passage of the center of a storm of this class the barometer rises and the wind shifts suddenly to northwest and gradually diminishes in force with clearing weather. In winter, however, light snow will sometimes continue several hours after the center of the storm has passed to the eastward. This is particularly true in cases where the passage of the storm center is followed by a cold wave. While storms from the middle west are common to all seasons of

the year the severer types of this class that endanger lake shipping are confined principally to the colder months.

The class to which the greater number of lake storms belong includes all disturbances that move from the northeast Rocky mountain slope and the British northwest territory almost directly toward the upper lakes. During the colder months many of these storms advance from the north Pacific ocean. Disturbances of the northwest type are seldom very severe or destructive over the lake region. They are preceded in all seasons by falling barometer and southerly winds that set in twenty-four hours or more before the storm center reaches the lakes. The force of the south to southwest winds that attend the approach of a storm from the northwest depends upon the depth of the barometric depression and the gradient it presents. On the United States side of the great lakes, with the exception of Lake Michigan, they are, however, offshore winds. Following the passage of the center of a northwest storm the wind at points on the great lakes shifts to west and northwest and diminishes in force and the barometer rises rapidly. In winter the precipitation that attends storms of this class is generally light, and heavy snow seldom, if ever, falls south of the track of the storm center. In summer the rain that falls usually comes in the form of thunderstorms and the high winds in squalls from the southwest at the time the center of the storm is passing.

Some of the severest storms of the great lakes have been of tropical origin. Fortunately this class of storms has been of exceedingly rare occurrence, and when they have occurred their advance from the Gulf of Mexico or the south Atlantic coast of the United States has been abundantly indicated by the general meteorological conditions that have attended and preceded their advance.

### CONSOLIDATED LAKE SUPERIOR CO.

President Cornelius Shields of the Consolidated Lake Superior Co. has sent an appeal to all the stockholders of the company asking them to subscribe for a proposed issue of bonds to the extent of \$15,000,000, "in order to save their investment in the property." The financial condition of the company has recently caused its stockholders and officers much concern, and a loan of \$5,000,000 was effected after considerable trouble. President Shields in his statement to the stockholders tells in detail what has been done by the board of directors toward the providing of funds to the amount of about \$9,000,000 to meet the company's needs. Continuing, he says:

"The last three weeks have been spent in endeavors to find a way by which this money could be provided. Inasmuch as all of the assets of the company were pledged to the bankers as security for the temporary loans of \$3,500,000 and \$1,550,000, which were made last December, the directors have been obliged to confine their negotiations to the holders of this collateral, as there has been nothing to offer for security for the new loan elsewhere. Efforts have been made to induce the bankers to increase their loans on their present collateral up to \$7,500,000 but without success. The only course which is open under the circumstances is for the stockholders to pay off the present bankers' loans and provide additional capital which the company must have in order to carry on its business. To do this it will be necessary to raise \$7,500,000. The only apparent way to do this is to create an issue of \$15,000,000 of thirty-year 4 per cent. collateral trust bonds, of which \$12,500,000 is to be offered to the stockholders at 60, the balance to be reserved for future use. These bonds would be secured by the stocks and by bonds secured by mortgages on the subsidiary companies of the Consolidated Lake Superior Co., which are now held by the bankers as collateral for their temporary loans."

### THOSE GOVERNMENT DREDGES.

There is, of course, no way of accomplishing anything except by keeping everlasting at it. It is reported that the dredging interests of the great lakes are discouraged and have about given up hope of blocking the government's design to build dredges for lake work. If this should be so it is unfortunate. No battle was ever won by retreating after the first shot. The dredging companies should take the fight into congress and thresh out the question of government interference with private enterprise. The war department is unquestionably overstepping its legitimate functions in building dredges. The fact that it has built them for sixty years does not alter the principle a particle. The repetition of wrong never makes right. The government might as well go into the business of building bridges and paving streets (they are all avenues of transportation) as to dredge channels. Moreover, everything done by the government, and especially under army methods, is very expensive and the people are made to pay thereby too much for their whistles. Probably an earnest campaign among lake congressmen might be productive of some good. A prominent dredging man, speaking on the subject of government dredging, said the other day:

"The dredging concerns of the lakes can, taking all things into consideration, do more work for 25 cents than the government, with its own plant, can do for \$2. The government engineers, when they are figuring the cost of work, go at it by giving a test, saying so much material can be excavated by their machine in half an hour and so much in an hour and so much more in twelve hours. They figure the cost of the work during the test and announce those figures as the actual cost of operation. They do not take into consideration the cost of the plant before any work is done;

neither do they figure they will have a crew the whole year, nor, as I understand it, are the total outlays figured as against the amount of work done, but when the plant is in operation they say the work has been for a certain amount per square yard, when, as a matter of fact, all things considered, the actual cost is many times that amount, counting the outlay on construction and actual expenses. It is the opinion of the men now in the business that the government will soon find it is not in a profitable business when it goes in against the dredgers who are now and have been engaged in dredging and in doing other public work. The point which I try to make is that if the government dredges would take their gross expenses for a period of one year, or five years, as against the actual amount of earth excavated, as they require of the contractors, the government work would cost \$2 where it now costs the contractors 25 cents. They do not take into consideration in their theoretical figuring the labor, repairs and office expenses which run the year through. With the dredgers it is a matter of accomplishment and with the government a matter of figures."

#### AROUND THE GREAT LAKES.

Capt. B. C. Gray of Cleveland, well known in lake shipping circles, died on Saturday last of typhoid.

A new chart of Little Sodus bay has just been issued by the United States lake survey. It may be had from the Marine Review.

Daniel Sinclair, manager at Port Huron for the Great Lakes Towing Co., has resigned and Warren Little has been named to succeed him.

Duluth has been attracting vessel property by a low rate of taxation. Custom house records at that point now contain 337 vessels of 493,620 tons.

Another big steel freighter, the P. P. Miller, under construction at the Buffalo works of the American Ship Building Co., is nearing the launching stage.

It will cost about \$2,300 to repair the passenger steamer Bon Ami, lately ashore on Lake Superior. Wrecking bills amount to \$1,500 more. The steamer was insured against total loss only.

Charles S. Boone, dredging contractor of Toronto, is engaged in digging slips and otherwise preparing the grounds at Bridgeburg, Ont. (Niagara river) where the works of the Canadian Ship Building Co. of Toronto are to be located.

Stephen F. Langell, who was engaged in ship building in Cleveland during the greater part of his life, died on Saturday last. He was for years a member of the firm of Radcliffe & Langell. He had been a resident of Cleveland for fifty-six years.

Divers from the Metcalf Diving Co. of Cleveland are raising the machinery of the steamer Quito. The machinery, which consists of a towing outfit, anchors and chains, has been bought by the Great Lakes Towing Co. The Quito sank last fall while trying to make Lorain harbor.

Mr. W. J. Wood, who designed the fireboat built by the Ship Owners Dry Dock Co. of Chicago, for the city of Milwaukee, and who is looking after her construction for the Milwaukee officials, looks for her completion very early in August.

A large anchor with heavy iron stock standing straight up with but 21 ft. of water over it has been located at the foot of Lake Huron, two miles north of the lightship and directly in the course of vessels passing into the St. Clair river. A buoy will be maintained over it until it can be removed.

A whaleback was being towed up the Cuyahoga river, Cleveland, on Sunday and was an object of much curiosity to a visitor who was surveying it from a street car window. "What do they call those things?" she asked of a female companion. "That," said the companion surveying the craft critically, "is called a clamshell."

The new revenue cutter Tuscarora for the great lakes is expected to reach Milwaukee in September. On her arrival the Niomill, now stationed at Milwaukee, will be sent to the Detroit station and the Fessenden will be sent to the station in Florida. The Mackinac is to be assigned to anchorage duty at the Sault. Capt. David A. Hall will command the Tuscarora.

Breyman Bros. were the lowest bidders on 1,100,000 yds. of dredging for widening and deepening the channel of Black river to the Lorain Steel Co.'s docks. Bids for the work were as follows: Breyman Bros., place measurement, \$332,750; scow measurements, \$236,125; J. J. Stang, place measurements, \$350,025; scow measurements, \$251,668; L. P. & J. A. Smith Co., place measurements, \$327,937; scow measurements, \$267,000. The bonds will be sold Aug. 11, after which work will begin.

Mr. William Becker of Cleveland has sold the schooner Annie M. Ash and the tug Sweepstakes, which went to the Atlantic coast a short time ago from the lakes, to the Davis Coal & Coke Co. of New York. The tug Peter Smith will be brought back to the lakes. The barges Wadena and Fitzpatrick, which were part of the original fleet sent to the coast, were wrecked. It was in endeavoring to save the Wadena that William H. Mack of Cleveland and the crew of the Monomoy life-saving station lost their lives.

Capt. Ira Mansfield, local United States inspector of vessel hulls at Chicago, has been notified of his permanent appointment to the position he now fills. Capt. Mansfield received the temporary appointment just three months ago, and the limit of time provided under the civil service rules for temporary appointees expired with that time. It is expected that the Washington officials will announce the permanent appointment of Roy L. Peck, United States inspector of marine boilers, very soon. He was

temporarily appointed to the position shortly after Capt. Mansfield was appointed.

The volume of freight carried by the Canada Atlantic railroad having outgrown the facilities of its fleet trading between Depot Harbor and Chicago, the steamer Chili has been chartered and added to the line. Every steamer westbound has been obliged to leave freight on the dock at the Canadian port and of late it has so accumulated that the steamer Kearsarge was recently sent back from Chicago without cargo in order to relieve the congestion. The steamer Chili left Chicago Sunday on her first trip under the new arrangement.

Alarmed at the threatened destruction of wharves through careless erection of buildings, the Chicago River Improvement Association is to start agitation for government inspection of proposed buildings along the stream. Already one fine wharf, built for a coal company near Halsted street in the south branch, has been ruined by driving piling alongside the river. The wharf bulges, thus narrowing the stream and creating a menace. The damaged wharf is one of many constructed for the sanitary district at a total cost of many thousand dollars.

An odd craft is the steamer Willow of St. Joseph, Mich. She was built to run in the St. Joseph river between Berrien Springs and Cook's landing, where no steamers have yet been able to operate because of shallow water. The new boat, which is 60 ft. long and 12 ft. in the beam, is said to be the only boat in the United States built on the plan adopted by English naval engineers for use in the Nile river. The vessel has an attachment overhanging her stern and dipping into the water, which, when her twin screws are in operation, tends to raise the stern and lessen the draught of the boat. The Willow is licensed for 150 passengers and will carry 15 tons of freight, but draws less than 2 ft. of water.

All records for dredging on the great lakes are due to be broken by contractors deepening the Sturgeon Bay canal. Reports to government officials for the first month of operations there indicate that the big job of deepening and widening the canal to give access to the largest boats on the lakes will be completed within few months instead of two years, as was expected. Over 150,000 yds. of earth have been taken out, loaded into scows and dumped into Lake Michigan. The dredge working at Sturgeon bay is the largest on Lake Michigan. It is capable of lifting 7 yds. of earth at a dip and has worked without ceasing since sent from Chicago by the Chicago & Great Lakes company. Ordinarily dredges lose several days monthly through stress of weather, but the protection afforded in the canal is favorable to continued activity, and not a day has been lost.

A few days ago it was announced from West Bay City that Capt. James Davidson of that place, who has made a million or two in the building and operation of wooden vessels on the lakes, would give up ship building upon the completion of a large wooden schooner that has just reached the launching stage; but this report does not jibe with an interview with Capt. Davidson in which he talks of building hundreds of wooden craft of the 1000-ton barge kind if the Erie canal improvement scheme goes through. Of course it is possible that his plans regarding canal barges contemplate the building of them at some place other than West Bay City. Capt. Davidson is thus quoted: "It is practically settled that the state of New York is going to enlarge the Erie canal so that boats of 1,000 tons, equipped with low speed engines and run on an economical plan will form the bulk of the traffic. There will be a demand for at least 100 of these boats within one year from the time the enlarging is completed, and I am going to build most of them. I am now closing contracts for ten of these boats and have contingent orders for ten more and the work will be started as soon as the New York legislature passes the canal bill. The talk about ship timber giving out is rot; there's plenty of it around, but it would pay us to bring it from Seattle, if necessary. I figure that the enlarged canal will give lake trade the greatest impetus it has ever had. We will be fully prepared and push the new work for all it is worth."

#### A 550-FOOTER.

For some time past Gen. Mngr. J. C. Wallace of the American Ship Building Co. has talked of building for the ore trade of the lakes a steamer of 550 ft. keel, capable of carrying more than 10,000 tons. Plans for such a vessel were prepared some time ago. The largest vessels now on the lakes are the Steel Corporation steamers Gates, Hill, Edenborn and Elwood, known as the "big four." Their dimensions are 498 ft. over all, 478 ft. keel, 52 ft. beam and 30 ft. depth. The depth will not be increased in the proposed new monster and the beam would be little greater than that of the "big four," but Mr. Wallace says that even without proportionate increase in depth and breadth the 550-footer can be built and made structurally as strong as any of the large freighters now in commission. It is understood that other officials of the ship building company, as well as some of the leading vessel owners, agree with Mr. Wallace as to the practicability of building such a vessel and also agree with him that conditions attending the transportation of ore will be made ready shortly for such vessels. The report from Duluth that a syndicate headed by Mr. A. B. Wolvin is to order the big steamer probably has some foundation, as it was upon suggestion from Mr. Wolvin that the plans were undertaken several months ago.

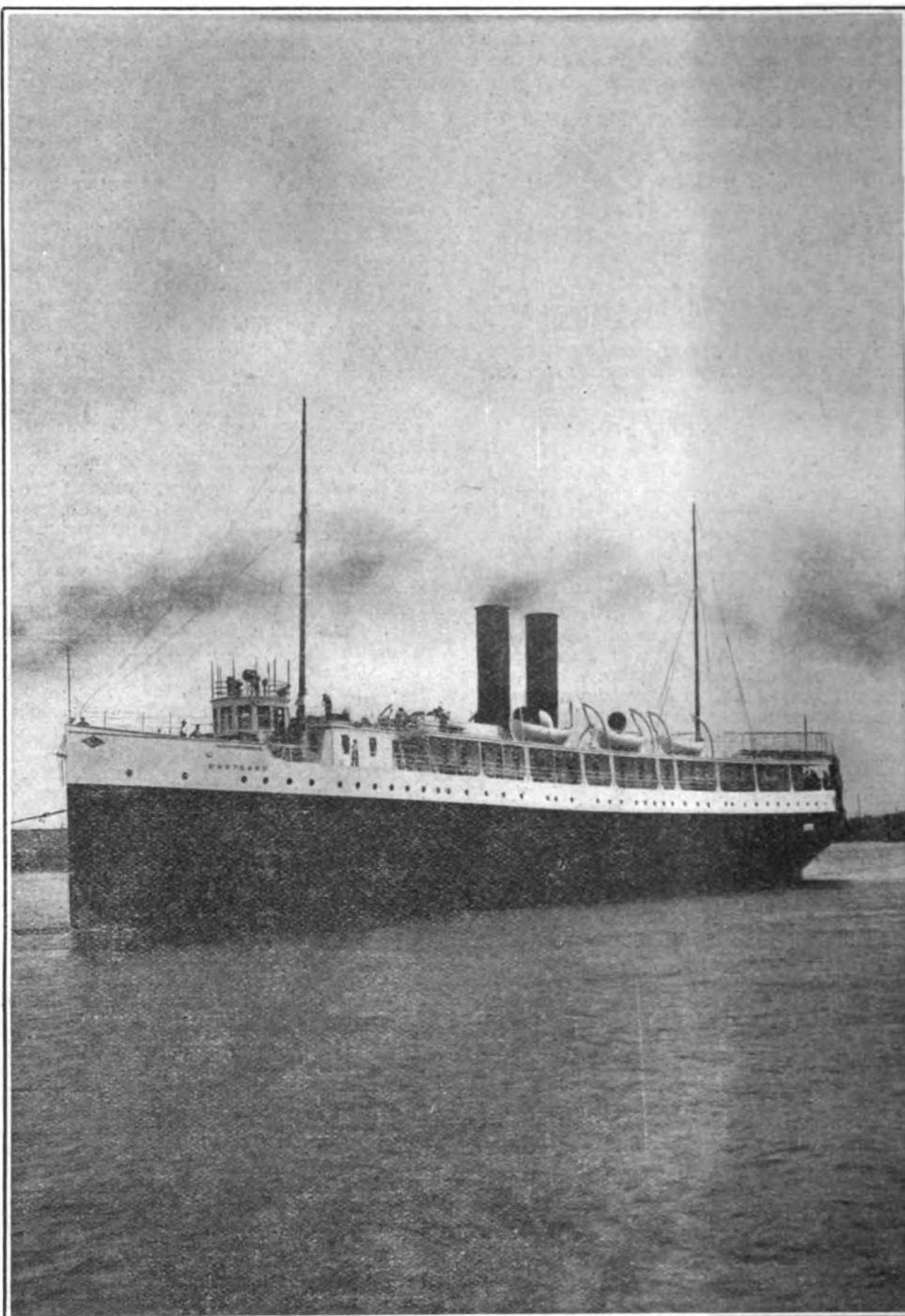
The steamer Shawmut of the Boston Steamship Co.'s fleet is undergoing extensive repairs at Moran Bros. & Co.'s yard, Seattle, Wash.

## TWIN SCREW STEAMER EASTLAND.

A picture of the twin-screw passenger and freight steamer Eastland, which has just been delivered to the Michigan Steamship Co. of South Haven, Mich., by the Jenks Ship Building Co. of Port Huron, Mich., appears on this page. Until they began work on this vessel, the Jenks Company's plant at Port Huron had been engaged almost entirely on large freighters of the ore and grain-carrying kind. In the Eastland they present a high-class steamer that is expected to be among the fastest on the lakes. The vessel is attractive in appearance and engineers who have seen her say she will certainly be fast. She will be engaged mainly in the fruit trade between South Haven and Chicago, but her appointments for passengers are of the highest order and she will undoubtedly attract quite a large passenger patronage. Dimensions are: Length over all, 275 ft.; length of keel, 265 ft.; beam, 38 ft.; molded depth, 22 ft. 8 in. Her depth of hold is 10 ft. 9 in. She is fitted with a double bottom throughout. There are five watertight bulkheads. The hull construction in all respects is unusually strong. The vessel is equipped with two triple-expansion engines, having cylinders of 21, 34 and 56 in. diameter with stroke of 30 in., and supplied with steam from four Scotch boilers, 13 ft. 6 in. in diameter and 12 ft. 6 in. long, allowed a working pressure of 200 lbs. The horse power is about 3,500 and the vessel is intended to maintain a scheduled speed of 20 miles an hour. The Eastland has three steel decks. Her main and upper saloons are fitted throughout in mahogany in the most approved manner. Her staterooms, of which there are 100, reach flush out to the deck so that there is no promenade about them as in most passenger vessels. However, there is a house on top of the deck with promenade about it. The dining room is forward

of the main saloon and is finished in quartered sawed oak in contrast with mahogany. The dining room reaches from side to side of the steamer and is, of course, abundantly lighted by that arrangement. It is probably the most attractive part of the ship. The smoking room is aft of the upper house, approached from the gallery, and the ladies' cabin is on the saloon deck. The part of the vessel devoted to passengers is entirely free of annoyance on account of freight. The steamer is equipped with every convenience, including electric lights throughout, a powerful searchlight, running water in every stateroom, etc. Officers of the Eastland are Capt. J. C. Perue, First Officer Charles R. Richardson and Chief Engineer Geo. F. Randall.

The City of South Haven, built by the Craigs of Toledo, is another new steamer on Lake Michigan, covering the same route that is to be covered by the Eastland. She is also fast.



Twin-screw steamer Eastland, owned by the Michigan Steamship Co.

[Built by Jenks Ship Building Co., Port Huron, Mich.]

## LONGSHOREMEN'S CONVENTION.

During the present week the International Longshoremen, Marine & Transport Workers' Association is in convention at Bay City, Mich. Over 200 delegates are in attendance, representing 516 locals and 140,000 men. It is gratifying to note that the leaders of this organization are persistently reminding the men of the absolute necessity of living up to contracts. In his address President Daniel J. Keefe took a decided stand against the sympathetic strike. His address was full of sensible advice and his convictions were given with straightforwardness that indicated sincerity and a knowledge of the importance of the matters he discussed. He said relative to the sympathetic strike:

"There is at times in new organizations too much of the hurrah spirit and grown men act as school boys with their first pair of boots. In this connection I want to say most emphatically that the so-called sympathetic strike cannot be countenanced by our organization. When deserving, we can lend our aid and moral support, yet we must not forget that our honor and manhood are involved in the obligations of our contracts and agreements. The influence and respect we command is due to fidelity and to faithful performance of each and every agreement entered into."

In speaking of the effect on public sentiment of the conduct of members of the organization either during strikes or in their daily life, Keefe said: "And in choosing those relations and amusements we should choose those which really refresh the mind and body. Our means of recreation and amusement should not be confined to the saloon. It is impossible to look about in certain localities in our idle season without being grieved at the manner in which our labor, energy and accumulations of the summer is expended. Let us supple-

ment the effort of the church and other social reform agencies. It becomes the duty of our organization to assist and counsel a wayward brother, and to help him resist and overcome the evil of intemperance. Each and every officer, each and every member can assist by example, and in some way contribute his aid in the regulation of morals and manners in all things (and this question of intemperance in particular) which affect the happiness and prosperity of the individual members of the organization. It is intemperance that causes the softness of the mental fiber. If there is any one habit or practice which brings disease, suffering and disorder, which abridges and retards the power and influence of labor, shortens the span of life and inflicts misery upon the innocent, which humiliates and degrades the worker, it is drink. Our younger members should not overlook the fact that many excellent opportunities are offered in the manual training

schools whereby they can put in their idle time to great advantage."

The annual report of Secretary Barter indicated that he was thoroughly in accord with the president regarding sympathetic strikes and the daily life of the men. His report showed a satisfactory condition of finances. One local alone, that of Galveston, has \$100,000 in its treasury. At the second day's session Delegate Hanlon of Chicago presented a resolution asking the association to take some action towards breaking up the present stevedore system in Chicago. He claims that there are half a dozen stevedores in Chicago and one at South Chicago who do no work except to collect the money and pay the men. The stevedores receive the same pay as the men who do the work and sometimes have a dozen jobs on at once. The solution will receive the support of the association. The licensed tugmen want the aid of the association in securing a change in section No. 4449 of the revised statutes of the United States, which is so worded that when a licensed officer refuses to work on a boat he is liable to subject himself to a revocation of license. The marine firemen ask that all organizations affiliated with the longshoremen refrain from making contracts until all others have reached an agreement. Last year the longshoremen could not assist the firemen in their strike, as their contracts would not allow sympathetic strikes. Requests were made by delegates that the association open negotiations with the Anchor Line, Western Transit Line, Union Transit Co., Canada-Atlantic Line and Illinois Steel Co. for the correction of certain unsatisfactory conditions of labor.

#### NEW CANADIAN STEAMSHIP CO.

The Canadian Transit Co. (Ltd.) has been incorporated under the Ontario companies' act to carry on a general navigation business, with offices at Ottawa, Ont., and a capital of \$1,000,000. The incorporators are R. Bickerdike, A. Lemieux, C. N. Blakeley and R. Lemieux of Montreal, and C. B. K. Carpenter of London, Eng. The company proposes to operate in connection with the New Canadian Co. (Ltd.) of London, Eng., which has been recognized by a Dominion act of parliament. The New Canadian company proposes to construct deep water wharves and other terminal facilities at Gaspe, Que., and to act as the construction company for a line of railway from Gaspe to the Intercolonial railway at Causapscal, Que., and thence to Edmundston, N. B. It is claimed that Gaspe is an all the year port, with a sufficient depth of water to provide for the largest ocean-going steamers, and that those behind the company are in a position to secure a portion of the transatlantic trade for the new port. It will be within the recollection of marine men that in 1897 or 1898 an attempt was made to inaugurate a transatlantic service between Paspebiac, Que., in Gaspe county, Que., and Milford Haven, Eng., and was abandoned owing to the steamer getting caught in the ice off the port.

#### MONTHLY REPORT OF LAKE COMMERCE.

The bureau of statistics, now a part of the government department of commerce and labor, endeavors to compile monthly reports of lake commerce. A late bulletin says that 139 ports on the lakes report 7,112,814 net tons of freight received during May, and for the season to the end of May, 10,639,517 net tons, compared with 10,692,996 net tons in 1902. The volume of traffic is, therefore, practically as large as last year's in spite of the somewhat later opening of navigation this year.

It is stated from the same source that shipments of grain from elevators at Buffalo for five months ending with May were 31,941,900 bu., compared with 28,162,804 bu. last year and 24,133,824 bu. in 1901. Shipments of grain by canal from Buffalo up to the end of May were 2,070,193 bu., compared with 2,508,436 bu. last season.

#### IRON AND STEEL STATISTICS.

The annual statistical report of the American Iron & Steel Association for 1902, published by James M. Swank, No. 261 South Fourth street, Philadelphia, is now ready for distribution. It will be found upon examination to embrace all the leading features of previous reports and also many new features. Special attention has been paid in this report to the statistics of our imports and exports of iron and steel, iron ore, manganese ore, coal and coke. Tables are given which show our annual imports of iron and steel and also of tinplates from 1871 to 1902; also our annual exports of iron and steel for the same period. Another table gives our annual imports of iron ore since 1879. The tables relating to our production of pig iron have been greatly extended. Full statistics are given of Bessemer, open-hearth, crucible and miscellaneous steel castings. Full details are also given of the shipments of iron ore from the Lake Superior and other mines, the imports of Cuban iron ore, the prices of Lake Superior iron ore, the tonnage of iron and steel vessels built in 1901 and 1902, immigration in 1902 and previous years, etc., etc. The department of the report which is devoted to prices has been enlarged to embrace the monthly prices of steel bars at Pittsburgh in the last seven years and complete and authentic quotations of the monthly prices of tinplates during the last four years. Canadian iron and steel statistics, compiled from reports made by the manufacturers to the American Iron & Steel Association, are full and complete. The report closes with a fresh study of the world's production of iron and steel and iron ore and coal in 1901, the first year of the twentieth century, and with detailed statistics of the annual production of iron and steel, iron ore and

coal in the five great iron and steel producing countries of the world—the United States, Great Britain, Germany, France and Belgium—from the earliest periods for which authentic statistics are available. The necrological record is continued for 1902 and 1903.

#### PROGRESS OF NAVAL CONSTRUCTION.

The usual monthly bulletin from the navy department dealing with progress of work on new vessels of war notes a gain for the Newport News Ship Building & Dry Dock Co. as against the New York navy yard in the time contest over the construction of the battleships Connecticut and Louisiana. On June 1 the degree of completion for the Louisiana at the Newport News yard was 12 per cent., while that of the Connecticut at the navy yard was 10 per cent. On July 1 the Newport News ship is credited with 16 per cent., or a gain of 4 per cent., while the navy yard ship is put down at 12 per cent., or a gain of only 2 per cent. The summary follows:

Name.	Building at	Degree of completion. Per Cent.	
		May 1.	June 1.
<b>Battleships.</b>			
Missouri	Newport News Co.	93	94
Ohio	Union Iron Works	75	77
Virginia	Newport News Co.	32	36
Nebraska	Moran Bros. Co.	20	21
Georgia	Bath Iron Works	28	31
New Jersey	Fore River Ship & Engine Co.	37	39
Rhode Island	Fore River Ship & Engine Co.	37	39
Connecticut	Navy yard, New York	10	12
Louisiana	Newport News Co.	12	16
Vermont	Fore River Ship & Engine Co.	0	0
Kansas	New York Ship Building Co.	0	0
Minnesota	Newport News Co.	0	0
<b>Armored Cruisers.</b>			
Pennsylvania	Cramp & Sons	50	52
West Virginia	Newport News Co.	52	54
California	Union Iron Works	28	32
Colorado	Cramp & Sons	55	57
Maryland	Newport News Co.	49	52
South Dakota	Union Iron Works	28	31
Tennessee	Cramp & Sons	0	1
Washington	New York Ship Building Co.	0	1
<b>Protected Cruisers.</b>			
Denver	Neafie & Levy	91	93
Des Moines	Fore River Ship & Engine Co.	86	88
Chattanooga	Lewis Nixon	73	74
Galveston	Wm. R. Trigg Co.	66	66
Tacoma	Union Iron Works	77	79
Cleveland	Bath Iron Works	97	98
St. Louis	Neafie & Levy	18	20
Milwaukee	Union Iron Works	19	24
Charleston	Newport News Co.	39	43
<b>Gun Boats.</b>			
Dubuque	Gas Engine & Power Co.	0	0
Paducah	Gas Engine & Power Co.	0	0
<b>Training Ships.</b>			
Cumberland	Navy yard, Boston	0	0
Intrepid	Navy yard, Mare Island	0	0
<b>Training Brig.</b>			
Boxer	Navy yard, Portsmouth	0	0
<b>Torpedo Boats.</b>			
Stringham	Harlan & Hollingsworth	98	95
Goldsborough	Wolff & Zwicker	99	99
Blakely	Geo. Lawley & Son	99	99
Nicholson	Lewis Nixon	98	99
O'Brien	Lewis Nixon	98	98
Tingley	Columbian Iron Works	96	96
<b>Steel Tugs.</b>			
Pentucket	Navy yard, Boston	80	80
Sotoyomo	Navy yard, Mare Island	20	38

#### SHIP YARD NOTES.

At the yard of the New York Ship Building Co., Camden, N. J., on Saturday last the fireboat Abram S. Hewitt for New York city was launched. She is 110 ft. long and 24 ft. beam and is designed for a speed of 10 knots.

John Lindstrom, Aberdeen, Wash., has been given an order to construct two steam schooners for Beadle Bros., San Francisco. Their dimensions are: Length, 179 ft.; beam, 35 ft.; depth, 14 ft. 10 in. They will cost about \$60,000 each.

The C. W. Morse, said to be the largest river steamboat ever built, was launched on Saturday at Wilmington, Del., for the People's Evening Line, for service between New York and Albany. The steamboat is built of steel, and, while closely following the lines of the Adirondack, is much larger. There are three full stateroom decks above the main deck and the arrangement of the rooms is such that all have outside ventilation. Four steel boilers will develop 4,500 H. P. Her engines will be fitted at Hoboken. The interior of the saloons, galleries and staterooms is in Louis XVI. style in white and gold.

## DRILLED VS. PUNCHED RIVET HOLES.\*

By A. F. Yarrow.

In the early part of last year the British admiralty contracted for a number of destroyers, and stipulated that the rivet holes in the hulls were to be drilled instead of punched, which, up to that time, had been the usual practice. As these vessels are fast approaching completion, it was thought that a few observations on this change in the method of working might be of interest to the meeting, and I have therefore much pleasure in laying before you the results of our experience as far as it has gone. It has been generally thought that punching is quite good enough for the plating of hulls, although in the best boiler work it is a thing of the past, the drilling being carried out in such a manner that any drifting of holes to make them fair is no longer permitted. Although in some classes of vessels the stresses on the riveted joints may not be so intense as those obtaining in boiler work, still there are many cases in which the joints are subject to very severe stresses, and, as these stresses vary in intensity and alternate in direction, their effects may be to loosen the rivets and thereby cause leakage, and ultimately to reduce the structural strength of the hull. In some destroyers, for example, experience has shown that with former methods of work there is often not sufficient margin for safety in the strength of the riveted joints.

There can be no question that anything that can be done to improve the quality of the work in lightly-constructed vessels of the torpedo-boat class is most desirable, because, reduction of weight being of primary importance in securing high speed, it very often follows that the stresses at the joints are very high. The same may be said of some of the large Atlantic liners. When the admiralty first stipulated that all the holes in the destroyers were to be drilled, contractors did not look upon this condition with favor, for it was thought that it involved a great increase of cost and additional time for construction out of proportion to the better quality of work produced. The method we adopt is to drill the inside strakes of the shell plating, etc., by electrically-driven radial drills placed near the boats in the yard. The plates are then sheared and put in position on the ship's side or bottom. The outer strakes of plates are then put up, and are drilled in their place by light portable pneumatic drills, the inner plates acting as jigs for the holes in the outer strakes. The electrical drills we use have arms something like a double-jointed gas bracket, so as to be very readily adjusted. They are exceedingly handy and can be quickly set in any required position. The spindle has a quick-return motion, so that as soon as it is relieved it rises clear of the work. These drills were made by the Oerlikon Co. of Zurich, and have more than fulfilled our highest expectations of them, and are especially suited for our class of work. The speed of the drills' is variable—between 250 and 500 revolutions per minute. They are intended to drill holes up to  $\frac{5}{8}$  in. in diameter in steel plates having a tensile strength of about 40 tons per square inch. With these machines we at first used the ordinary Morse twist-drills, but eventually we made our own drills from "Speedicut" steel, and found that these were better suited to our purpose than any we had previously tried.

By adopting the system above described the holes are all dead true, and equal in every respect to the best boiler work. They are consequently ready for being riveted up without even a rimer or drift being used, nor any inaccuracy due to not getting the holes exactly in their correct positions. I think it is impossible to have any more accurate system of workmanship, and, what is perhaps more important than any other consideration, it places it out of the power of the workman to do bad work. I think it will be admitted that the strength of destroyers, and in fact of all classes of vessels, is materially increased by thus drilling the holes in the riveted joints, as not only do we get the benefit of the reduced damage to the plate, owing to drilling instead of punching, but secure an accuracy of workmanship far surpassing that obtainable by any other method.

I firmly believe that if this mode of construction were applied to our big liners, their life would be prolonged; they would not so often need to go into dry dock to have loosened rivets cut out and replaced, seams recaulked, etc. Such repairs frequently would be uncalled for if the work were put together in the first instance in the best possible manner, now rendered practicable by modern tools and modern methods; and the bill for repairs from time to time would be considerably reduced.

The man in charge of punching operations can seldom do anything but punch holes, and the holes he punches are not always exactly where he himself would wish them to be, and are certainly not always where those who superintend the work wish to see them. By drilling the skin-plating in place it is impossible to have anything but good work, and this is attended with a very slight, if any, increased cost. A service of compressed air all over a ship yard and on board each vessel during construction offers facilities for executing the work in the manner described such as were formerly unobtainable. It may surprise many to know that in our class of work, drilling holes as explained, does not, all things taken into account, adversely affect the cost or speed of construction. The fact is, in punching a plate a gang of men is employed to handle it, and, although the process of punching is much more rapid than that of drilling, there are very many more men employed. In drilling plates, whether in their place or in the yard, under a radial drilling machine, one man with suitable tools can perform the whole operation without any assistance, or any handling or moving of the plate.

I have stated above that the process of punching is more

\*Paper read at Engineering Conference, London.

rapid than that of drilling. This is true when comparing the punching and drilling of single plates. Punching must be done on one plate at a time, but it is often found possible to drill several plates at once. When similar plates for the two sides of a ship are required, these are placed one upon the other, bolted together and drilled simultaneously. Should more than one vessel of a type be in hand, then two, three or four pairs of similar plates are secured together and the whole drilled at one time. In such a case it is, of course, obvious that only the top plate requires marking off. It is at these times that the Swiss drill with its one attendant proves its extreme value. One single illustration must suffice. We have ourselves used these machines repeatedly on batches of eight plates bolted together. The average time taken to drill a  $\frac{3}{8}$ -in hole through eight 3-16-in. high-tensile-steel plates is less than 40 seconds, the holes being, of course, exactly in the required position. No punching-machine with its attendant gang can rival this. A large increase in the drilling-tackle of the yard is necessarily involved; but when driven by electricity or compressed air, the tools are both simple and inexpensive.

In conclusion, I should like to record my firm conviction that the drilling of holes in destroyers, which has been initiated by the admiralty, will, in the early future, become, as in boiler work, the method to be adopted in all the best classes of marine construction, not only in destroyers, but in other classes of ship building work; and I submit that the sooner our naval architects and insurance companies take this method into serious consideration the better. I have no hesitation in saying that, so far as our experience goes, I look upon this change of practice as one of the many instances of the admiralty having initiated progress, and I feel confident that the drilling of holes in the hulls of ships, especially for those subject to severe strains, is a move in the right direction.

## SHIPS WANTED.

Editor Marine Review:—I am again asking for a little space in your valuable publication for a few paragraphs herewith on the subject of American shipping in the foreign trade:

It is estimated that more than 20,000 Americans will visit Europe this season, and that their aggregate expenses will amount to at least \$100,000,000. Of this great sum about \$30,000,000 will be paid for passage, and nearly all of this will go to foreign steamship companies. But for the short-sighted policy of our lawmakers, a good part of this passenger service (to say nothing of freight carriage) would be performed by American ships.

"The Atlantic ocean rolling between two mighty hemispheres is a German, French and English sea, but the Pacific ocean, with twice the area of water, washing the shore of nationalities containing two-thirds of the population of the globe, is henceforth to be an American sea, covered with American ships, laden with the products of American industry. The commerce of half the world, realizing the dream of Columbus, will go westward to find the Indies."—Hon. Galusha A. Grow.

The Philippine commerce for 1902, as reviewed by the bureau of insular affairs, shows one bad feature for the United States—a feature which is a disgrace and heavy loss to any exporting and importing nation. That feature is that foreign vessels carried 94 per cent. of the American goods sold to the Philippines. And that is not the worst of it. Foreign vessels brought to our shores 99 per cent. of what the Philippines sold to us. In other words, we are paying foreigners nearly all the freights on this section of the business ourselves are doing with ourselves. British Consul-General Vrasier of Han-kan, China, reports that Japan is rapidly securing the trade of the Ying-tsze valley by fostering their ships with subsidies and thus enabling them to reduce freight rates.

The annual report of the Suez Canal Co. informs us that of the 3,708 vessels passing through the canal in 1902, no less than 2,165 carried the British flag. Here we see Britain's double advantage in securing foreign trade. She owns the canal and the ships too. In a few years we shall own a major ocean-connecting canal, but shall we own a majority of the vessels passing through it? It is up to congress to decide. Of the 201,153 tons of shipping which visited the port of Basra on the Persian gulf last year, no less than 164,341 tons were British—American ships do not figure in the list.

China's foreign trade in 1902 called for the entrance and clearance of 54,000,000 tons of shipping, of which 50 per cent. was British, 17 per cent. Chinese, 14 per cent. Japanese, and 12 per cent. German—American shipping shared with the rest of the world in the remaining paltry 6 per cent.

The subsidy bill pending before the last congress was defeated because of the assertion, iterated and reiterated, that American ship yards had more work than they could do. Such a bill may be passed by the next congress, upon the showing that one-half of our great ship building plants are bankrupt, and in order to save the remaining plants from a similar fate.

WALTER J. BALLARD.

Schenectady, N. Y., July 14, 1903.

The preparation of plans for a warship of the turbine class, designed to be the swiftest large vessel in the United States navy, has been suspended temporarily, owing to the discovery that in the calculations of the experts the increase in the size of the turbine is much more rapid than the increase in power, which is a reversal of the ordinary practice of mechanics, and that the turbine required would take up far more space than is available under any protected deck.

### THE STEAM TURBINE.

Prof. Rateau of Paris adds another chapter to current engineering literature on the subject of steam turbines. In a paper recently prepared he says that it is to the Hon. C. A. Parsons principally and to the Swedish engineer de Laval, that is owing the general introduction of the steam turbine into practical engineering during the past ten years. It should not be forgotten, however, that the idea of this general type of motor had already taken form in the brain of several inventors, and that among them the French engineer Tournaire is entitled to particular mention as having in 1853, just a half century ago, indicated the capabilities of the steam turbine. The disposition Tournaire indicated is almost exactly that developed thirty-two years later by Mr. Parsons, with, it is true, some very ingenious improvements, which have assured the success of the engine. Tournaire also conceived the helicoidal gearing since adopted in the de Laval system.

As in the case of reciprocating steam engines, steam turbines are heat engines, converting the calorific energy of the steam into directly available mechanical energy. From another point of view they are analogous to hydraulic turbines, and form part of the general class which the author will call "turbo-machines." To a person well grounded in the thermodynamic properties of steam, and possessed also of a thorough knowledge of the theory of the hydraulic turbine, nothing is easier than to design with confidence a steam turbine to satisfy a given purpose, provided, it should be understood, that he has previously determined the working coefficients to introduce into his calculations. Piston engines are not susceptible of such exact calculations, owing to losses at the admission and exhaust ports, and also to cylinder condensation. In turbines, the expansion of the elastic fluid can be pushed to its extreme limit much more conveniently than in the case of piston engines, whence they share the advantage of employing condensers giving the best possible vacuum. On the other hand, friction and leakage increase in proportion as the pressure is raised. From these opposite conditions it results that for low pressures turbines are more advantageous than reciprocating engines, while they generally consume more than the latter when the pressure of exhaust is that of the atmosphere, or higher.

As in the case of their hydraulic analogues, steam turbines may be divided into two principal classes—action and reaction turbines. Each of these classes is subdivided accordingly as the turbine is composed of a single wheel or of several wheels traversed successively by the steam in course of expansion. Among reaction turbines (analogous in hydraulics to the well-known Jonval turbine), of which, as multiple machines, the prototype is the Parsons turbine, the steam is only partially expanded in the distribution and acquires its full expansion in the movable wheel. The steam therefore acts on the blades at once by its pressure and its velocity. The movable wheel is thus subjected on its two faces to pressures of different amount, causing longitudinal thrust, which has to be balanced. These differences of pressure render it necessary to reduce to a minimum the clearance between the movable wheel and the walls by which the steam tends to escape without traversing the blades, and so doing useful work. It is indispensable that the distribution of the steam should be effected over the whole circumference of the movable wheel, in order to avoid movements of pulsation very prejudicial to efficiency. In the "action" turbine, on the other hand, the steam only acts on the movable wheels by its velocity. Each wheel revolves in a casing in which the pressure is uniform. Therefore the steam does not produce any sensible longitudinal thrust on the moving parts, which dispenses with the necessity for any special provision to neutralize such thrust. The steam does not tend to rush across the blades in order to pass from one face to the other at the expense of efficiency. It is therefore possible to provide sensible clearance between the moving and fixed parts, and consequently to disregard the wear of the shaft-bearing. Further, it is possible, if need be, to project the steam on to one point only of the circumference. Finally, under the same conditions, "action" turbines revolve at a less velocity than "reaction" turbines. This renders more easy the direct coupling to the machines worked.

The prototype of the simple action turbine is that of de Laval. The author conceives that the multiple-action turbine offers greater advantages. It is therefore a motor of this type that he has developed latterly. His turbine, known as the "multicellular," is composed of sheet-iron wheels, in greater or less number, fixed on the same shaft, and separated one from another by flat diaphragms. Many of these machines are already at work. Wheels of single sheet iron suffice up to a diameter of about 1 meter (39 in.). Above this diameter it has been found advisable, in order to avoid deformation, to make the wheels of two conical discs of that metal. These multicellular "action" turbines can be disposed so as to run with very little loss from friction or from leakage, and, as a result, the consumption of steam is proportionately small at any load.

It is not necessary to insist on the well-known advantage possessed by turbines in general of their smooth and continuous movement of rotation, but the excessive speed for which they are obliged to be designed, in order to meet the speed of flow of the steam, constitutes in many cases a serious inconvenience—e. g., in its application to ship propulsion. For a long time this hampered their use for electric installation, but latterly dynamos of very high speed have been constructed, worked by steam turbines, constituting an outfit of light weight, requiring small space, and, although of ample power, of low cost, and, as a consequence of working and upkeep, as simple as can be desired. It follows that for this purpose the steam turbine may be expected rapidly

to supplant the piston engine. Direct coupled to ventilators and centrifugal pumps, steam turbines, owing to their capability of producing great power at high speed, exhibit surprising results. The author has installed turbo-ventilators giving a pressure of half an atmosphere, and turbo-pumps with a lift of several hundred meters. He is prepared to install plants of several thousand horse power compressing air to more than 6 atmospheres, or raising water to more than 600 meters (say 2,000 ft.). This shows that the steam turbine possesses vast possibilities.

### AMERICAN SQUADRON AT PORTSMOUTH.

Apropos of the visit of the American squadron to Portsmouth the Engineer of London pays its respects to the ships comprising it (Kearsarge, Chicago, San Francisco and Machias) as follows:

The principal American vessel is the Kearsarge, one of many craft designed to "whip creation." She was produced before the Americans knew as much about ship building as they now do, but she is quite the finest example afloat of the art of the fadist. To begin with, she is the last of the low freeboard ships. Every other navy—even the British—had discovered that low freeboard was a mistake. Not so, however, the architect of the Kearsarge. He wanted something that would be a "small target," and produced an overgrown monitor, little more able to fight her guns in a seaway than her prototype. Desiring originality he—or his board—then evolved the superposed turret system, which possesses the following—amongst other—advantages: (1) For a given weight there is probably no disposition of artillery out of which so much rolling propensity can be obtained; (2) by no other device can so great a proportion of the armament be put at the mercy of a single projectile. However, in common fairness, we must admit that it looks well on paper—at any rate, to the general public who are fairly free from technical disabilities. Finally, the ship was given a box battery of fourteen 5-in. guns crowded amidships, a poor speed, and an exceedingly meager coal supply. There are some passably bad ships in the British navy, but to contemplate the Kearsarge may be a balm even when the worst of these is about. We have nothing that so flies in the face of all that is likely to be of value in war, unless it be the Admiral class.

The Kearsarge is, however, not entirely bad. She is at least able to hit pretty hard, her broadside being large. The following comparisons of the broadside of the Kearsarge and two of our ships of about 1,000 tons more displacement—which certainly covers anything they may carry extra in the way of coal—is interesting:

Kearsarge.	Trafalgar (as designed).	Renown.
Four 13-in.	Four 13.5-in.	Four 10-in.
Four 8-in.	.....	.....
Seven 5-in.	Three 4.7-in.	Five 6-in.

Certainly the Americans realize that it is a great thing to have the wherewithal to smite the foe.

The other American ships are not of much account. They are the cruisers Chicago and San Francisco, both old, and interesting only because of the reconstruction that they have undergone. They are rather like the Irishman's gun that was given a new stock and a new barrel. There is precious little of the original ships left. The fourth American vessel is the gunboat Machias, a craft of no fighting value at all. As the United States, when the ships now building are completed, will be the third naval power, the squadron coming to Portsmouth can in no way be taken as representative of the American fleet. This should be borne in mind by those who may visit us, otherwise they will form a very incorrect estimate of America's naval strength.

### BIG CANAL FOR SCOTLAND.

From cable dispatches it appears that plans for the construction of a ship-canal between the Firth of Forth, on the east of Scotland, across to the River Clyde on the west, have been definitely arranged. The canal will cost \$50,000,000, but powerful support is expected from the British government. One of the great engineering features of the scheme will be the carrying of the canal through the high ground near the Loch Lomond end. An indication of the saving in distance that would be effected by the canal will be gained from the following figures: From the Clyde to ports on the east coast of Scotland, northeast of England, and northwest of Europe the distance saved would be from 529 miles to 238 miles. From the Firth of Forth to ports on the west coast of Scotland, northwest of England, Ireland, America, and the Mediterranean the distance saved would be from 487 to 141 miles. From Tyne ports to the St. Lawrence river the distance saved would be 150 miles. From the west of Britain and northeast of Ireland to middle western ports of the continent the distance saved would be from 377 to 98 miles.

Plans for the steel sailing ships Cumberland and Intrepid, to be used for training naval apprentices and landsmen, have been prepared by the bureau of construction, and work on them will be begun soon at the Boston and Mare Island navy yards. Each vessel will be 210 ft. 6 in. over all, 176 ft. 5 in. on the waterline, 16 ft. 5 in. draught and of 1,800 tons displacement. The only machinery on board will be for auxiliary purposes. Accommodations will be provided for sixteen commissioned and warrant officers and 320 men. The battery will consist of six 4-in. rapid-fire guns, four 6-pounder rapid-fire guns, two 1-pounder rapid-fire guns and two Colt automatic guns, caliber .30. For each vessel congress appropriated \$370,000.

**TRADE NOTES.**

An order for a deck planer to be shipped to the United States navy yard at Pensacola, Fla., has just been received by the Atlantic Works Incorporated of Philadelphia.

Mr. Geo. H. Gibson has resigned as manager of the advertising and publication department of the B. F. Sturtevant Co., Boston, to accept an appointment with the International Steam Pump Co., having offices at 114-118 Liberty street, New York. Mr. Gibson was formerly connected with the Westinghouse Companies' Publishing Department of Pittsburg and was for two years a member of the editorial staff of the Engineering News of New York.

Inquiry among the Delaware river ship yards shows that generous quantities of Lucas' deck paint, manufactured by John Lucas & Co. of Philadelphia, is used both on new vessels and in repair work. Lucas' deck paint is adapted for decks and cabins, while the company's enamel paint has been found reliable for covering pipes and marine machinery. This company also furnishes large quantities of glass and similar products to the ship yards and has unusual facilities for quickly filling orders. So large is the company's plant in New Jersey that the location is called Lucastown.

The Brown-Cochran Co. of Lorain has just issued an interesting and comprehensive catalogue, illustrative and descriptive of their carbonic anhydride system of refrigerating machinery for steamships and yachts. The principal claims made for this system of refrigerating machinery are that it offers the smallest and strongest compressing cylinders and pipes, the least consumption of power, the greatest lightness and compactness of apparatus, and, above all, great safety. These claims sustained should make it a most desirable system to be adopted, and how they are sustained is fully explained in the catalogue.

The Lunkheimer Co. of Cincinnati, manufacturers of steam specialties and engineering appliances, tenders an outing about this time each year to its employees. The event this year is scheduled for Saturday of the present week at Woodside island park, which is thirty-one miles from Cincinnati on the C. H. & D. Ry. About 700 of the employees and their families will participate or in all about 2,000 people, including the children. Two trains of ten coaches will be required for transportation to and from the park. Everything is free, even to refreshments. The company bears the entire expense of the outing. The program of amusements and sporting contests is an elaborate one.

Cleveland is still adding to its record of being a city containing a large number of electrically-operated manufacturing plants. The Cleveland Foundry Co. recently added to its equipment a Westinghouse, 100-kilowatt, 250-volt, engine-type generator, and fourteen direct-current motors, ranging in capacity from 5 to 30 H. P., together with the necessary switchboard and auxiliary apparatus. The Corlett Engineering Co. is looking

after the engineering work. The Cleveland Worsted Mills are also installing two additional Westinghouse, three-phase alternators, one of 400 kilowatts and the other of 100 kilowatts capacity, as well as several Westinghouse, type C induction motors, aggregating about 600 H. P., which will be used to drive line shafting in the mills.

Mr. W. S. Duncan, originator of Rogers butt and ship cements and Rogers non-corrosive steel coating, perhaps the most perfect rust preventative for metal boats on the market, has been offered and has accepted the position of manager of the marine department of the Detroit White Lead Works. Mr. Duncan is well known to the vessel interests of Europe as well as America, and although the Detroit White Lead Works has always had quite a large trade in marine paints, it is more than probable that their business in this line will show a marked increase under the supervision of Mr. Duncan. The Detroit White Lead Works is to be congratulated and Mr. Duncan's many friends in marine circles will join in wishing him the success that is sure to come to him on account of his knowledge and ability in the business in which he is engaged.

Mr. Geo. B. Drake, formerly connected with lake ship building, has resigned his position with the Standard Oil Co., to undertake business on his own account in Philadelphia, where he has been stationed for the past eighteen months assisting in the construction of the new Standard Oil fleet. Mr. Drake and Mr. H. Matteson, Jr., have entered into a partnership as naval architects and marine engineers. They will also represent several standard lines of marine supplies. They are now handling the Secor kerosene oil engine, made by the General Power Co. of New York. Mr. Drake spent several years with the Union Dry Dock Co. of Buffalo, becoming general superintendent when that company united with the Mills Dry Dock Co., under the name Buffalo Dry Dock Co. His long experience in lake ship building, together with the close connection he has had with the various coast yards during the construction of the new tank vessels, will be of great value in his new venture, and he will start out with the best wishes of his many friends on the lakes and Atlantic coast.

Capt. J. C. Sanford, government engineer in charge of harbor improvements at Philadelphia, opened bids a few days ago for the construction of two twin-screw suction dredges for the United States government for service in New York harbor. The lowest bidder was the Maryland Steel Co., Sparrow's Point, Md., which offered to build the two dredges in thirteen months for \$304,000 each. The other bids were: Cramps, Philadelphia, \$410,000; Harlan & Hollingsworth Co., Wilmington, Del., \$323,675; New York Ship Building Co., Camden, N. J., \$344,000. The appropriation was \$350,000.

# BELLEVILLE WATER-TUBE BOILERS

**NOW IN USE (FEBRUARY, 1903)**

**On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.**

French Navy	-	-	-	-	-	-	-	-	276,460	H. P.
English Royal Navy	-	-	-	-	-	-	-	-	849,300	"
Russian Imperial Navy	-	-	-	-	-	-	-	-	193,900	"
Japanese Imperial Navy	-	-	-	-	-	-	-	-	122,700	"
Austrian Imperial Navy	-	-	-	-	-	-	-	-	32,900	"
Italian Royal Navy	-	-	-	-	-	-	-	-	13,500	"
Chilian Navy	-	-	-	-	-	-	-	-	26,500	"
Argentine Navy	-	-	-	-	-	-	-	-	13,000	"
The "Messageries Maritimes" Company	-	-	-	-	-	-	-	-	87,600	"
Chemins de fer de l'Ouest: (The French Western Railway Co.)	Steamships		plying between Dieppe and Newhaven		-	-	-	-	18,500	"
Total Horse Power of Boilers in Use	-	-	-	-	-	-	-	-	1,634,360	

**WORKS: Ateliers et Chantiers de l'Ermitage, at Saint-Denis (Seine), France.**

**TELEGRAPHIC ADDRESS: Belleville, Saint-Denis-Sur-Seine.**

**ITEMS OF GENERAL INTEREST.**

Under the new schedule of Canadian iron bounties the Dominion Iron & Steel Co., Sydney, C. B., is expected to receive over \$1,000,000 as against \$350,000. The entire schedule is considered particularly favorable to Dominion Iron & Steel Co.; in fact, it is so arranged that other Canadian iron and steel industries, including the Clergue works, are benefited only to a small extent. It is thought in Canada that the restriction by which it is necessary to use at least 50 per cent. of Canadian pig in order to get the benefit of bounties will somewhat block the United States Steel Corporation's project at Port Colborne, although it will also work against the use of Newfoundland iron by the Dominion Iron & Steel Co.

At the present moment the German navy does not possess a submarine boat, and, so far as is known to the general public, no boat of that type is in course of construction. The ship building firms of Germany have, however, been engaged for some time in attempts to discover some type of submarine boat that would be used almost exclusively for coastline defense. So soon as anything definite is arrived at it is expected that the German government will give the ship builders some encouragement. Hitherto naval circles in Germany have not been at all in favor of submarines being used in their navy. However, there are now signs that there has come about a change of opinion in the matter.

Convinced that she can be restored to her former state of efficiency, Secretary Moody has approved the recommendation of Rear Admiral Bowles, chief constructor of the navy, for a complete overhauling of the armored cruiser New York at a cost of \$500,000, in addition to giving her a new battery costing another \$500,000 and to a thorough repair of her engines and boilers. The New York is at present at the Pacific station.

Mr. William Garrett, president of the Garrett-Cromwell Engineering Co. of Cleveland, died at Mt. Clemens on Wednesday from the effects of a stroke of paralysis. Mr. Garrett was well known as an inventor in steel circles and devised many improvements in rod mills. He was of Scotch parentage and came to this country in 1878.

Sunday party rates via Nickel Plate road.—Persons desiring to avail themselves of the very low rate afforded for parties of five or more traveling on same train from any station on the Nickel Plate road to any other station on that road within 100 miles from starting point and return same day, are hereby notified that they are required to procure such tickets before the arrival at starting point of the train on which they desire to travel. Agents are not permitted to sell these excursion tickets within five minutes of the time advertised for the departure of the train for which they are sold.

114, July 24

## The Blue Book of American Shipping

is a marine directory and is the only one published in the United States.

It contains a correct list of names and addresses of ship builders, engine and boiler builders, vessel owners, steamship lines, repair yards, dry docks, dredging companies, marine engineers, captains of vessels and all persons identified with shipping and its allied trades.

If you are a manufacturer or dealer in products consumed by any of these, the Blue Book is the very book you want.

It will be to your advantage to subscribe to the Blue Book in advance of its publication for this reason: A classified directory of marine manufactures and supplies is compiled from among its advertisers and subscribers and this list is consulted constantly by ship builders and ship owners. Your name will be entered under suitable headings according to your products.

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The 1903 edition of the Blue Book is now in course of preparation, therefore promptitude is a necessity if you desire your name to be inserted in the classified directory.

The price of the Blue Book is \$5.00 and it is delivered free of carriage.

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Cleveland, Ohio.

## HUDSON RIVER SOUVENIR BOOK.

The Hudson River Day Line has issued a handsome souvenir book containing a well-told story of the world-famed Hudson river and the scenes along its course, profusely illustrated by half-tones in photographic tint. The letter text deals with the historical and legendary lore of the Hudson, and as the region is particularly rich in such subjects it makes most interesting, not to say fascinating, reading as well as being highly instructive. The illuminated cover contains an illustration in colors of the "Half-Moon," the high-pooed little vessel in which Henry Hudson ascended the river in 1609. Among the illustrations with which the book is embellished is the far-famed palisades, which, beginning opposite the upper end of New York city, stretch up the western shore of the river for twenty-three miles, and are a never-ending source of wonder and admiration to the beholder. The magnificent tomb of General U. S. Grant is shown with the Hudson in the background and the Jersey shore in the distance. A grand vista is given in a double-page representation of the "Southern Gateway of the Highlands," which conveys a fair idea of the grandeur and beauty of the scene at this point. "Passing Stony Point" shows the bow of a Day Line steamer with passengers on main and upper decks intently viewing the scene of one of the stirring events of the Revolutionary war. "Stony Point" gives a nearer view of this historical spot made famous by the gallant dash of Mad Anthony Wayne during the struggle for American freedom, when with his little band of patriots he captured the stronghold from the British by an assault as audacious as it was vigorous. "Looking up the Hudson" gives a view up the river from West Point, one of the best vantage points on the river. A novelty in photographic half-tone art printing is a double-page "View of West Point from Dining Room of Day Line Steamers." In the foreground is shown a section of steamer dining room, with tables set, etc., while through the spacious plate-glass windows West Point is seen in all its grandeur and beauty, with the bend in the river to the west and in the background the mountains on the opposite shore, whose feet dip into the water. "Approaching Old Cro' Nest" shows a Day Line steamer approaching that mountain, which shows in the near distance.

"Approaching Newburgh Bay" shows the bow of a Day Line steamer in the foreground with the passengers viewing the scene, looking through the Northern Gateway of the Highlands, a scene once viewed never to be forgotten. On the left is Cro' Nest and Storm King mountains, while on the right Mounts Torris and Breakneck rear their majestic heads, and in the distance is seen the farther shore of Newburgh bay. Then comes a nearer view of "Storm King Mountain," looming up from the water's edge in all its wild and rugged grandeur and with Breakneck on the opposite shore, standing as the grand and silent guard of the majestic river on its entrance to the Highlands. A near view of "Washington's Headquarters at Newburgh," with its surroundings, comes next. This historical land-mark of the revolution, which is plainly visible from the decks of the Day Line steamers, is state property, is used as a museum of revolutionary relics, and is therefore a Mecca of more than ordinary attraction to all tourists.

"The Albany Day Line One Hundred Years Ago" aptly illustrates the march of progress when compared with the facilities of modern travel, and inclines one to the belief that in "ye goode old days" men's souls were wont to be tried in days of peace as well as war. A double-page illustration shows the "Catskill Mountains," as seen from the decks of the Day Line steamers, a truly charming scene, the picturesqueness of which is added to by resort hotels perched here and there on the vantage points and village nestling among the foothills; the whole calling up visions of that jolly, lovable vagabond Rip Van Winkle, made dear to all our hearts by Irving and Joseph Jefferson. "Kingston Point," with its ornate buildings and beautiful grounds, much frequented by outing parties, is shown and also the state capitol at Albany and the present celebrated steamers of the Hudson River Day Line, as well as the Mary Powell, which before the advent of the New York and Albany was the crack steamer of the Hudson, and is only second to them at the present day.

While the book is of the highest merit from literary, artistic and typographical points of view, and contains a fund of valuable information regarding the region of which it treats, it is still

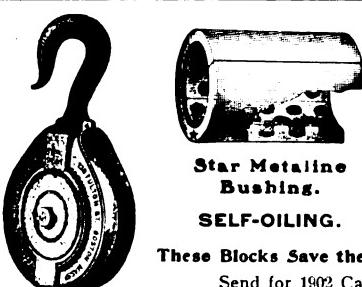
but the shadow of the substance, and a trip both up and down the picturesque Hudson is necessary in order to fully realize its full charm. A trip on one of the Hudson River Day Line steamers between New York and Albany is a most delightful experience and makes one of the most pleasant pictures to hang on memory's wall to be obtained in a lifetime. They are express steamers, carrying no freight, only passengers and their baggage, have ample room and seating capacity for all allowed on board, and having feathered paddle-wheels speed through the water without vibration. They are provided with dining rooms where meals are served *a la carte* or *table d'hôte*, as desired, and, taken altogether, are, in a word, things of beauty and comfort. They leave New York and Albany every morning during the season, Sunday excepted, about 8 o'clock, arriving at destination about 6 p. m., making very convenient hours for passengers.

The souvenir book will be sent prepaid to any address on receipt of fifteen cents in cash or stamps by F. B. Hibbard, general passenger agent, Hudson River Day Line, Desbrosses street pier, New York.

## PNEUMATIC TOOL PATENTS.

Reference was made in these columns recently to the refusal of Judge LaCombe of the United States circuit court, southern district of New York, to dissolve the injunction granted against the Philadelphia Pneumatic Tool Co. on application of the Chicago Pneumatic Tool Co., claiming infringement of patent rights. The decision of the court is as follows:

"The patent in suit has been several times before the courts and sustained in the face of vigorous opposition. It was last considered by the court of appeals in this circuit, in a suit by these plaintiffs against the Franklin Boiler Works. The tool claimed to be an infringement in that cause was made by the defendant here, and said defendant conducted the defense. Upon the rendition of opinion by the court of appeals injunction *pendente lite* was granted in the case at bar. Thereupon complainants put in their *prima facie* proofs and defendant subsequently took its proofs in answer. They are voluminous, defendant's record comprising over 400 printed pages. Immediately upon closing its proofs and before complainant's time to take proofs in rebuttal had expired, defendant moved to vacate the injunction upon selected portions of the answering proofs, specifying the parts thus selected in the notice of motion. No precedent for such practice is referred to and it is not one which commends itself to the court. To allow defendant to prepare and present an elaborate defense, dependent largely on the oral testimony of witnesses as to transactions which took place twenty years ago, and then to move upon its case thus made, or rather selected parts thereof, before complainants have had the time which the rules and practice insure them to reply to such defense by testimony similarly taken, seems manifestly unfair. Defendants refer to a decision of this court, in which it is said that the granting of an injunction *pendente lite*, under the circumstances of that case, 'is without prejudice to a motion to dissolve the injunction should defendant be able to produce any prior patents or publications which may indicate that the novelty or patentable invention of the complainant's appliance is fairly questionable.' This case is Fuller vs. Gilmore, 121 Federal Reporter, 129. In the Fuller case, however, the patent had never been adjudicated. Where it has been, the only prior patents and publications to be considered on a motion to dissolve are such as were not before the courts which have already sustained the patent. Conceding the propriety of moving to dissolve on such new documentary evidence, in advance of final hearing, it may be noted that although the notice of motion refers to five patents, one only of them (Leach 271, 480, Jan. 30, 1883) is wholly new. All the others were before the court in one or other of the former litigations, assuming the accuracy of the statement of complainant's counsel that the Sharoneck patent was in evidence in the Standard case, the record in the latter case not being at hand. This second Leach patent, considered by itself, does not indicate that prior decisions would have been different had it appeared in prior records. The defendant's expert has given testimony direct and cross as to its bearing on the questions here presented. When the complainants shall have had opportunity to answer such testimony and complete their proofs, the court at final hearing may appropriately consider the whole case, but upon the fragmentary record now presented the motion to dissolve the preliminary injunction should be denied."



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**BREAK-UP OF ATLANTIC CONFERENCE.**

Concerning the reasons for the break-up of the Atlantic conference the Liverpool correspondent of the Shipping World says:

"There are and have been for some time past grave business differences between the Cunard and White Star lines, two of the constituent members of the North Atlantic conference. The bone of contention is not confined to the additional weekly Friday sailings which the White Star Line is now inaugurating, although these have had their effect in accentuating the grievance. To ascertain the true cause of the trouble it will be necessary to go back to the year 1895, when the conference was first formed, comprising, in addition to the White Star and Cunard companies, the Allan, Dominion, Anchor, American (Philadelphia and Southampton services), and one or two foreign steamship lines. At that time, for irregular sailings to New York, other than the vessels engaged in the regular weekly Wednesday sailings, the White Star had only the Cymric, but since then they have built the Celtic, Cedric and the Arabic, the latter having sailed on her maiden voyage only recently. With these four large twin-screw and up-to-date passenger and cargo boats, the White Star Line are now enabled to institute a regular Friday passenger service to New York, in addition to the usual Wednesday sailings, the only difference being that the vessels engaged in the Friday service are less speedy and less luxuriously fitted up; and, correspondingly, the rates are lower.

"Although the conference rules governing the occasional Friday sailings of the White Star liner Cymric at that time may not have anticipated a regular weekly service, they certainly recognized it, for the Cunard company were parties to the conference agreement that the White Star vessels sailing on Friday should charge a lower rate for first, second and third-class passengers than the Cunard company would charge for the Umbria and Etruria, vessels sailing on Saturday. How the Cunard company came to be parties to such an agreement, it is not for me to explain or account for, but I think it is pretty clear now that they were outwitted. The effect has been that passengers lately going to New York have had to choose between, say, the Cedric sailing on Friday and the Umbria on the following day; and it is reasonable to assume that the choice would invariably fall on the Leviathan Cedric, as she is the largest vessel afloat. The choice would doubtless so fall even if the rates were equal, but as a matter of fact they were, and are, lower according to the terms of the conference agreement. But besides the Cedric, the weekly Saturday sailings of the Cunard are henceforward to be preceded on the Friday by equally attractive boats, in fact almost sister ships, in the Celtic, Arabic and Cymric. From the foregoing facts the effect will be apparent. Passengers who would otherwise travel by the Cunard Saturday sailings are without doubt attracted to the Friday vessels of the combine, because of their up-to-date character, and are possibly further influenced by their lower rates. Boats of the Umbria and Etruria class built twenty odd years ago are thus called upon to compete with modern vessels of the highest type, and against lower passenger rates in the bargain. As an instance of how the Cunard company are adversely affected by these Friday sailings, it may be cited that Scandinavians are known to make for the largest boats with twin screws, and they are said to be disinclined to sail by the smaller and older boats; meanwhile the Cunard company are obliged to charge the higher rate on these sailings. This condition of things is regarded as prejudicial to the Cunard company, and the wonder is that the commotion and break-up have been staved off so long. It is presumed that the Cunard did not want to break the agreement if it were possible to come to some amicable arrangement in the way

of modifying it. On the other hand, while under the workings of the conference the White Star officials have never been known to give way in any dispute, they have carried out the conference rules to the very letter. And the same statement is true of the Cunard and Allan lines also.

Whether the foregoing facts constitute all the immediate causes of the Cunard company's withdrawal from the North Atlantic conference or not, it is certainly true that they are withdrawing. Their notice in regard to the continental agreement expired on May 20 or thereabouts, and the fourteen days' notice they served to terminate the obligations in the British and first and second-class agreements expired on July 1. Whether the differences will be accommodated and the terms readjusted remains to be seen, but it is not regarded as likely that there will be any cutting of rates resorted to. The combine in its present financial condition is not likely to initiate such a policy. The German boats require the very top rates to make them pay at all. The lines that run the cheapest boats are the only ones that can cut rates, and it is a poor remedy under almost any sort of circumstances.

"If there is going to be 'war' between these two companies, it is recognized that the Cunard company are on the right side of the hedge. They have the government imprimatur to look forward to, and a firm hold on the Atlantic passengers. Furthermore, their vessels are speedier, for taken all round the Lucania, Campania, Etruria and Umbria have a better average as regards speed than their competitors the Oceanic, Majestic, Teutonic and Germanic."

**OWNERS OF THE WHITE STAR LINE.**

Fairplay of London in its determination to convince the British public that the White Star Line is not a British line publishes the following list of stockholders of the Oceanic Steam Navigation Co., Ltd. (White Star), made up on May 28 last. The capital of the company stands at £750,000 in 750 shares of £1,000 each, all of which have been taken up:

	No. of shares.
J. Bruce Ismay, 30 James street, Liverpool.....	I
Harold O. Sanderson, 30 James street, Liverpool.....	I
International Navigation Co., 24 James street, Liverpool.....	742
Rt. Hon. W. J. Pirrie, Queen's Island, Belfast, ship builder..	I
Henry Wilding, 27 James street, Liverpool, gentleman.....	I
James Gray, 5 New Court, Lincoln's Inn, London, solicitor..	I
Sir Clinton E. Dawkins, K. C. B., 22 Old Broad street, London, merchant .....	I
Walter S. M. Burns, 22 Old Broad street, London, merchant.	I
Edward C. Grenfell, 22 Old Broad street, London, merchant.	I

750

The directors are J. Bruce Ismay, W. J. Pirrie and Harold A. Sanderson.

The International Navigation Co., which holds practically all the above shares, has a capital of £700,000 in £10 shares, the whole of which, with the exception of seven, are held by Americans. "In the face of this official report," says Fairplay, "how can anyone pretend that the White Star is a British Co.? Clearly, the International Navigation Co. of Liverpool owns the White Star Line, and the New Jersey Co. has bought the company which owns the Oceanic Co. which, being free from incumbrance, is, therefore, American-owned."

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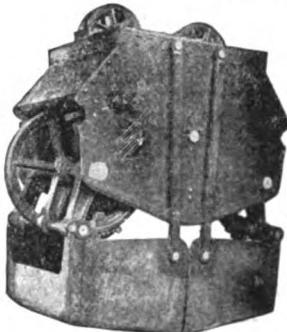
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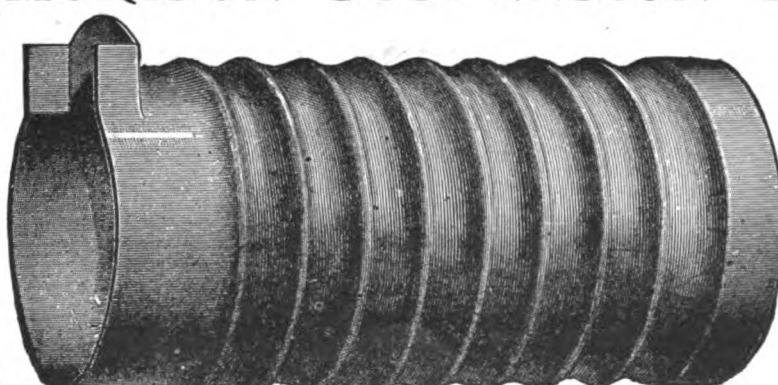
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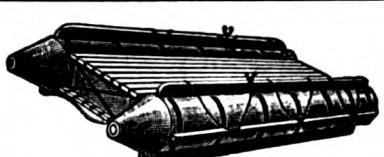


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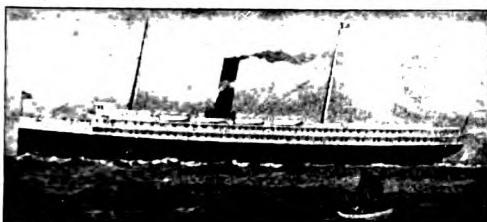
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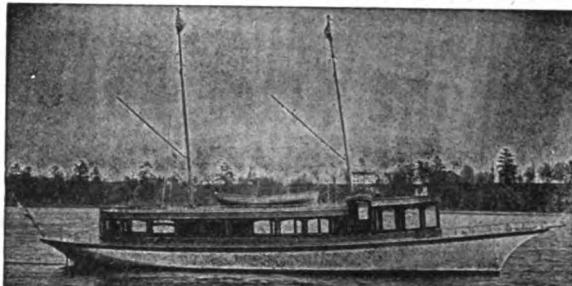
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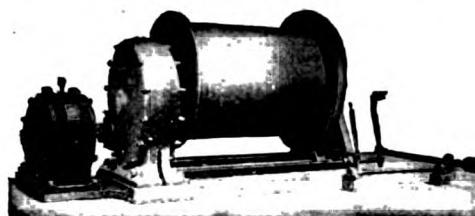
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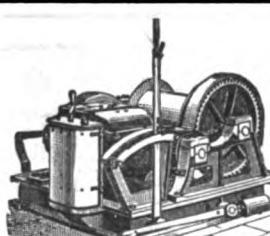
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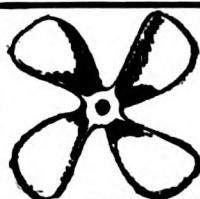
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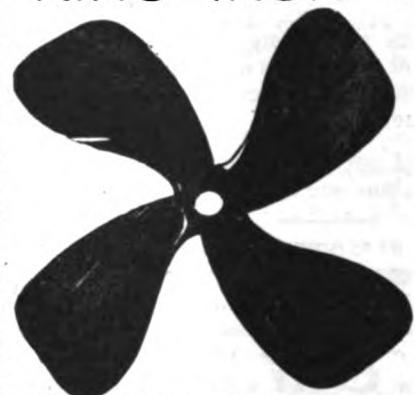
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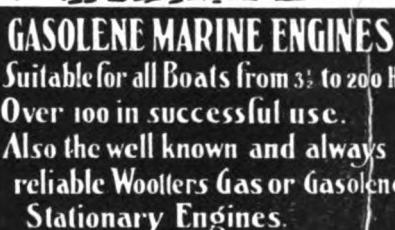
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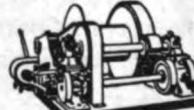
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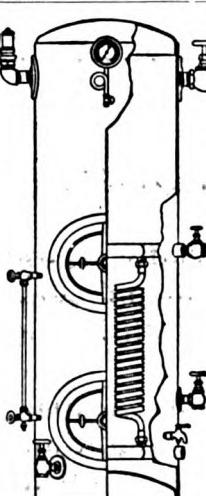
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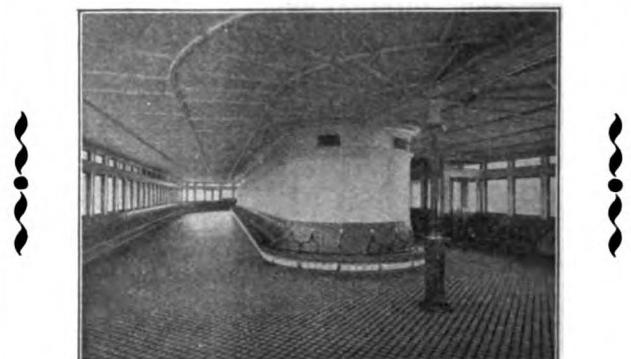
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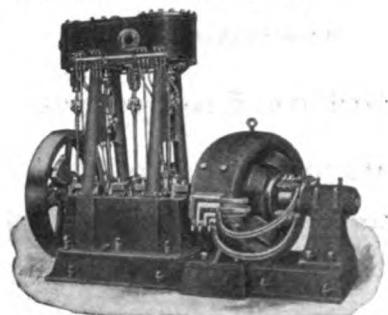
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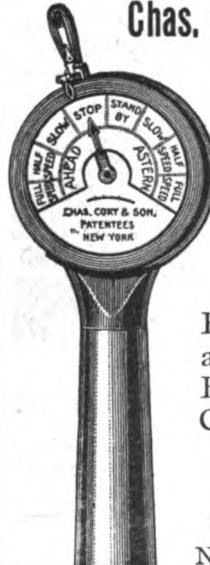
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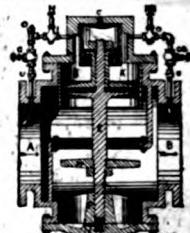
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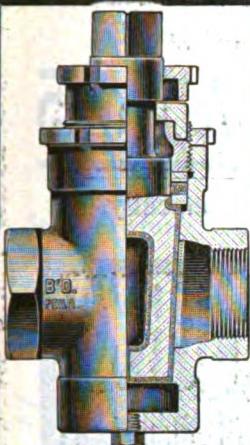
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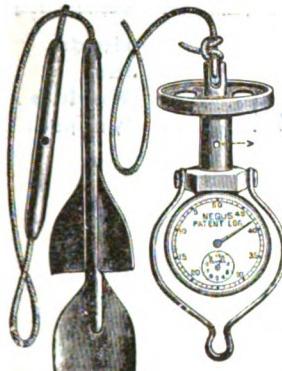


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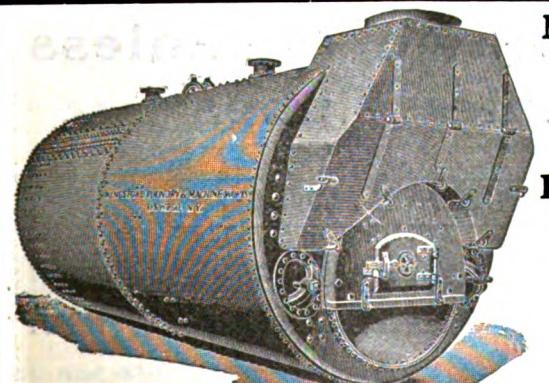


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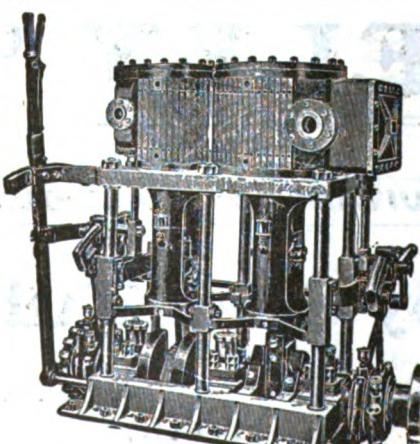
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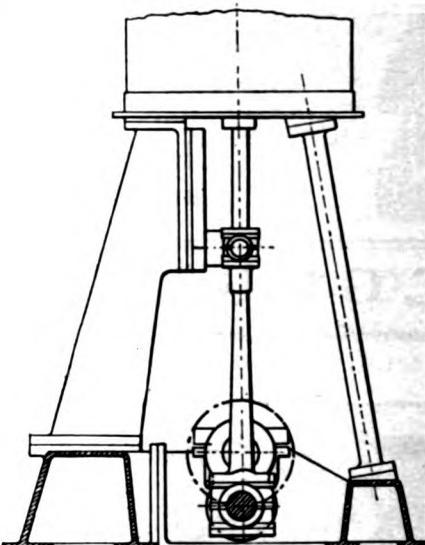
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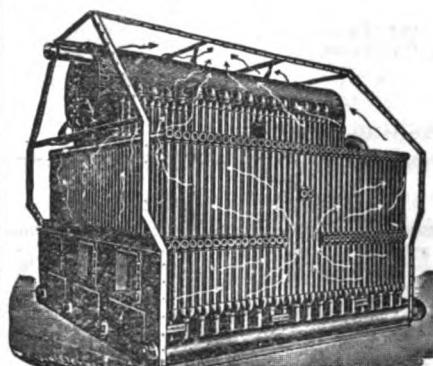
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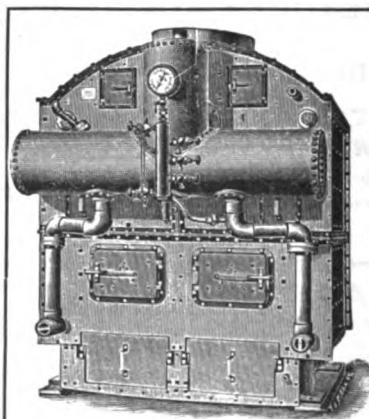
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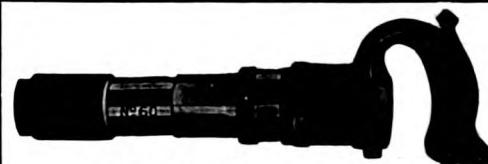
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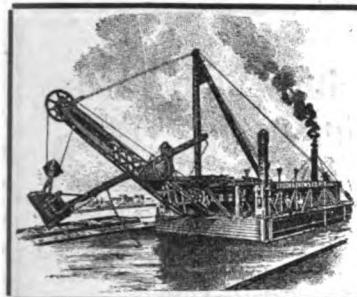
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Harvard. (In the Slip—Two Views).

Helena.

Hennepin.

Islander. (Thousand Islands—Two Views).

Frank E. Kirby at Put-in-Bay.

Lackawanna.

Mahoning.

Haboning.

Michigan Central in Detroit River. (Winter).

Mohawk.

Montana.

W. B. Morley, wreck in Detroit River, Aug. 6, 1899.

Simon J. Murphy. (On the Ways).

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Simon J. Murphy, Launch. (Bow in Slip, Stern not yet in Water).

Neshoto.

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Tashmoo. (In Dewey Naval Parade, Detroit River).

Tashmoo, June 9, 1900.

Tashmoo. (Entering St. Clair Flats Ship Canal).

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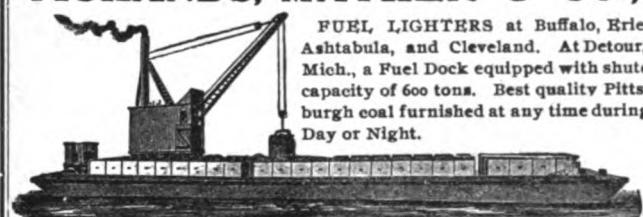
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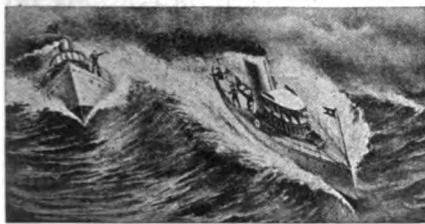
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Weltzel Lock, from above.  
Weltzel Lock, from below.  
Str. North-Land Passing Locks, two views.  
Upper Entrance to Lock Canal.  
Gate Mechanism.  
Interior of Power House.  
Canadian Lock from Upper End.  
Canadian Lock from Lower End.  
The Rapids, looking up.  
The Rapids, looking across.  
Indians fishing in the rapids.

### PANORAMIC VIEWS.—7x17 inches at \$1.75 each.

Lackawanna Ore Docks—Unloading ore.  
American Steel & Wire Co.'s Plant, Cleveland.  
Ore Docks and Harbor, Cleveland.  
Ore Docks, Cleveland.  
Water Front, Detroit, from Windsor.  
Coal and Ore Docks at Oswego.

Address: MARINE REVIEW PUB. CO.,  
39-41 Wade Bldg., Cleveland, Ohio.

## BUYERS' DIRECTORY OF THE MARINE TRADE.

For a more complete classification than that represented by advertisers in the Marine Review and Marine Record, see the BLUE BOOK OF AMERICAN SHIPPING, marine and naval directory of the United States, published by the Marine Review Pub. Co., 39-41 Wade Bldg., Cleveland.

See accompanying index of Advertisers for full addresses of concerns in this directory.

**AIR COMPRESSORS, AIR HOISTS, ETC.**  
Chicago Pneumatic Tool Co. .... Chicago.  
"Long Arm" System Co. .... Cleveland.

**AIR PUMPS AND APPLIANCES.**  
Fore River Ship & Engine Co. .... Quincy, Mass.

**ANCHORS.**  
Balldt Anchor Co. .... Chester, Pa.  
Bowers, L. M. & Co. .... Binghamton, N. Y.  
DeGrauw, Aymar & Co. .... New York.  
Seaboard Steel Casting Co. .... Chester, Pa.

**ANTI-FRICTION METALS.**  
Cramp, Wm. & Sons. .... Philadelphia.  
Hardy, Wm. A. .... Pittsburgh, Mass.  
Phosphor Bronze Smelting Co., Ltd. .... Philadelphia.  
Pittsburg White Metal Co. .... Pittsburg, Pa.

**ARTIFICIAL DRAFT FOR BOILERS.**  
American Ship Building Co. .... Cleveland.  
Bloomburg & Co., H. .... Newport News, Va.  
Detroit Shipbuilding Co. .... Detroit.  
Startevant, B. F. Co. .... Boston.

**ATTORNEYS AND PROCTORS IN ADMIRALTY.**  
Brown, Harvey L. .... Buffalo.  
Gilchrist, Albert J. .... Cleveland.  
Goulder, Holding & Masters. .... Cleveland.  
Hoyt, Dustin & Kelley. .... Cleveland.  
Kremer, C. M. .... Chicago.  
MacDonald, Ray G. .... Chicago.  
McPherson, Clark, Campbell & Jarvis. .... Toronto.  
Pinney & Warner. .... Cleveland.  
Shaw, Warren, Cady & Oakes. .... Detroit.  
Spencer, H. R. .... Duluth.  
White, Johnson, McCaslin & Cannon. .... Cleveland.

**BANKERS.**  
Fahey & Co. .... Cleveland.  
Federal Trust Co. .... Cleveland.  
Cleveland Trust Co. .... Cleveland.

**BAROMETERS, MARINE GLASSES, ETC.**  
Bliss, John & Co. .... New York.  
Ritchie, E. S. & Sons. .... Brookline, Mass.

**BELTING, RUBBER.**  
New York Belting & Packing Co. .... New York.

**BLOCKS, SHEAVES, ETC.**  
Boston & Lockport Block Co. .... Boston, Mass.  
Cleveland Block Co. .... Cleveland.

**BLOWERS.**  
Startevant, B. F. Co. .... Boston.

**BOAT BUILDERS.**  
Drain, Thos. & Son. .... Wilmington, Del.  
Kahnweiler's Sons, David. .... New York.  
Lane & DeGroot. .... Long Island City, N. Y.  
Marine Construction & D. D. Co. ....  
Mariner's Harbor, N. Y., N. Y.  
Marine Iron Works. .... Chicago.  
Truscott Boat Mfg. Co. .... St. Joseph, Mich.  
Warrington Iron Works. .... Chicago.  
Willard, Chas. P. & Co. .... Chicago.

**BOILER MANUFACTURERS.**  
Almy Water Tube Boiler Co. .... Providence, R. I.  
American Ship Building Co. .... Cleveland.  
Atlantic Works. .... East Boston, Mass.  
Babcock & Wilcox Co. .... New York.  
Bath Iron Works, Ltd. .... Bath, Me.  
Boyer's Sons, L. .... New York.  
Chicago Ship Building Co. .... Chicago.  
Clyde Machine Works. .... Chicago.  
Columbia Iron Works. .... Port Huron.  
Cramp, Wm. & Sons. .... Philadelphia.  
Crescent Ship Yard Co. .... Elizabethport, N. J.  
Delaney Belleville & Co. .... St. Denis, France.  
Detroit Shipbuilding Co. .... Detroit.  
Fletcher, W. & A. Co. .... Hoboken, N. J.  
Fore River Ship & Engine Co. .... Quincy, Mass.  
Forest City Boiler Co. .... Cleveland.  
Jenks Ship Building Co. .... Port Huron, Mich.  
Kingford Foundry & Machine Works. .... Oswego, N. Y.  
MacKinnon Mfg. Co. .... Bay City, Mich.  
Milwaukee Dry Dock Co. .... Milwaukee.  
Moran Bros. Co. .... Seattle, Wash.  
Mosher, Chas. D. .... New York.  
Nease & Levy Ship & Engine Building Co. .... Phila.  
Newport News Ship Building Co. .... Newport News, Va.  
Pusey & Jones Co. .... Wilmington, Del.  
Rindon Iron Works. .... San Francisco.  
Roberts Safety Water Tube Boiler Co. .... New York.  
Stirling, The Co. .... Chicago.  
Superior Ship Building Co. .... Superior, Wis.  
Taylor Water Tube Boiler Co. .... Detroit.  
Union Machine & Boiler Co. .... Cleveland.  
United States Shipbuilding Co. .... New York.  
Warrington Iron Works. .... Chicago.  
Willard, Chas. P. & Co. .... Chicago.

**BOILER COMPOUNDS.**  
Dearborn Drug & Chemical Works. .... Chicago.

**BOILER RIVETS.**  
Bourne-Fuller Co. .... Cleveland.

**BOILER STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.**  
Falls Hollow Staybolt Co. .... Cuyahoga Falls, O.

**BRASS AND BRONZE CASTINGS.**  
Cramp, Wm. & Sons. .... Philadelphia.  
Fore River Ship & Engine Co. .... Quincy, Mass.  
Lunkenheimer Co. .... Cincinnati.  
Macbeth Iron Co. .... Cleveland.  
Phosphor Bronze Smelting Co. .... Philadelphia.

**BRASS—SHEET, ROD, ETC.**  
Waterbury Brass Co. .... New York.

**BRASS WORK, MARINE.**  
Farnan Brass Works. .... Cleveland.

**BRIDGES, BUILDERS OF**  
Scherzer Rolling Lift Bridge Co. .... Chicago.

**BUCKETS, ORE AND COAL.**  
Bartlett & Snow Co., C. O. .... Cleveland.  
Brown Holisting & Conveying Machine Co. .... Cleveland.  
Wellman-Seaver-Morgan Co. .... Cleveland.

**CABIN AND CABINET FINISHING WOODS.**  
Martin-Barries Co. .... Cleveland.

**CAPSTANS.**  
American Ship Windlass Co. .... Providence, R. I.  
Hyde Windlass Co. .... Bath, Me.

**CEMENT, IRON, FOR REPAIRING LEAKS.**  
Smooth-On Mfg. Co. .... Jersey City, N. J.

**CHAINS.**  
Standard Chain Co. .... Pittsburgh.

**CHAIN HOISTS.**  
Boston & Lockport Block Co. .... Boston, Mass.  
Dake Engine Co. .... Grand Haven, Mich.

**CHARTS.**  
Marine Review Pub. Co. .... Cleveland.  
Potter, J. D. .... London.

**CIRCULATOR, EQUILIBRUM.**  
With Steam Heating Attachment.  
Bloomsburg & Co., H. .... Baltimore, Md.

**CLOCKS (Marine), CHRONOMETRES, BELLS.**  
Anthon Valve Co. .... Boston.  
Bliss, John & Co. .... New York.  
Chelsea Clock Co. .... Boston.  
Ritchie, E. S. & Sons. .... Brookline, Mass.

**COAL PRODUCERS AND SHIPPERS.**  
Castner, Curran & Bellitt. .... Boston.  
Graham Coal & Coke Co., Ltd. .... Detroit.  
Hauna, M. A. & Co. .... Cleveland.  
Pickands, Mather & Co. .... Cleveland.  
Pittsburg Coal Co. .... Cleveland.  
Rochester & Pittsburg Coal & Iron Co. .... Buffalo.

**COAL AND ORE HANDLING MACHINERY.**  
Bartlett & Snow Co., C. O. .... Cleveland.  
Brown Holisting Machinery Co., (Inc.). .... Cleveland.  
Lidgerwood Mfg. Co. .... New York.  
Wellman-Seaver-Morgan Co. .... Cleveland.

**COMPASSES.**  
Bliss, John & Co. .... New York.  
Ritchie, E. S. & Sons. .... Brookline, Mass.

**COMPASS ADJUSTER.**  
Fields, Capt. J. M. .... Cleveland.

**CONTRACTORS FOR PUBLIC WORKS.**  
Buffalo Dredging Co. .... Buffalo.  
Chicago & Gt. Lakes Dredge & Dock Co. .... Chicago.  
Lake Erie Dredging Co. .... Buffalo.  
Smith Co., L. P. & J. A. .... Cleveland.

**COPPER, TIN AND SHEET IRON WORK.**  
Lake Erie Boiler Works. .... Cleveland.  
McCUTCHEON, C. H. .... Buffalo.  
Topky Brothers. .... Ashtabula, O.

**COPPER—SHEET, TUBES AND ROD.**  
Waterbury Brass Co. .... New York.

**CORDAGE.**

Baker & Co., H. H. .... Buffalo.  
DeGraw, Aymar & Co. .... New York.  
Upton-Walton Co. .... Cleveland.

**CORK JACKETS AND RINGS.**

Armstrong Cork Co. .... Pittsburgh, Pa.  
Kahnweiler's Sons, D. .... New York.  
Lane & DeGroot. .... Long Island City, N. Y.

**CHAIN CONVEYORS, HOISTS.**

Bartlett & Snow Co., C. O. .... Cleveland.  
Brown Holisting Machinery Co., (Inc.). .... Cleveland.  
Chicago Pneumatic Tool Co. .... Chicago.  
General Electric Co. .... Schenectady, N. Y.  
Lidgerwood Mfg. Co. .... New York.  
Westinghouse Electric & Mfg. Co. .... Pittsburgh.

**DEAD-LIGHTS, AIR-PORTS, ETC.**

"Long-Arm" System Co. .... Cleveland.

**DIVING APPARATUS.**

Morse, A. J. & Son. .... Boston.  
Schrader's Son, A. .... New York.

**DOORS, WATER TIGHT, ETC.**

Long Arm System Co. .... Cleveland.

**DRAWING MATERIALS.**

Schwencke, Kirk & Co. .... New York.

**DREDGE ENGINES FOR HANDLING DUMP SCOW LINER.**

Superior Iron Works. .... West Superior, Wis.

**DREDGING CONTRACTORS.**

Buffalo Dredging Co. .... Buffalo.  
Chicago & Gt. Lakes Dredge & Dock Co. .... Chicago.  
Lake Erie Dredging Co. .... Buffalo.  
Smith Co., L. P. & J. A. .... Cleveland.

**DRILL PRESSES—DRILLS OF ALL KINDS.**

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**DRYING APPARATUS.**

Startevant, B. F. Co. .... Boston.

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American Ship Building Co. .... Cleveland.  
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Buffalo Dry Dock Co. .... Buffalo.

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Detroit Ship Building Co. .... Detroit.

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Marine Construction & Dry Dock Co. .... New York.

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Milwaukee Dry Dock Co. .... Milwaukee.

Moran Bros. Co. .... Seattle, Wash.

Newport News Ship Building Co. .... Newport News, Va.

Pusey & Jones Co. .... Wilmington, Del.

Shipowners Dry Dock Co. .... Chicago.

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United States Shipbuilding Co. .... New York.

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Elwell-Parker Electric Co. .... Cleveland.

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General Electric Co. .... Schenectady, N. Y.

Westinghouse Electric & Mfg. Co. .... Pittsburgh, Pa.

**ELECTRIC LIGHT AND POWER PLANTS.**

Electro-Dynamic Co. .... Philadelphia.

Elwell-Parker Electric Co. .... Cleveland.

General Electric Co. .... Schenectady, N. Y.

Westinghouse Electric & Mfg. Co. .... Pittsburgh, Pa.

**ELECTRIC STEERING GEAR, SPEED AND RUDDER INDICATORS, ETC.**

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**ENGINE BUILDERS, MARINE.**

American Ship Building Co. .... Cleveland.

Atlantic Works. .... East Boston, Mass.

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Buffalo Forge Co. .... Buffalo.

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Chase Machine Co. .... Cleveland.

Columbia Iron Works. .... Port Huron.

Craig Ship Building Co. .... Toledo, O.

Cramp, Wm. & Sons. .... Philadelphia.

Crescent Ship Yard Co. .... Elizabethport, N. J.

Dake Engine Co. .... Grand Haven, Mich.

Detroit Ship Building Co. .... Detroit.

## BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

## ENGINE BUILDERS, MARINE.—Continued.

Fletcher, W. & A. Co. .... Hoboken, N. J.  
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 Great Lakes Engineering Works.... Detroit, Mich.  
 Hall Bros. .... Philadelphia.  
 Jenkins Ship Building Co. .... Port Huron, Mich.  
 Lockwood Mfg. Co. .... East Boston, Mass.  
 MacKinnon Mfg. Co. .... Bay City, Mich.  
 Maryland Steel Co. .... Sparrow's Point, Md.  
 Milwaukee Dry Dock Co. .... Milwaukee.  
 Moran Bros. Co. .... Seattle, Wash.  
 Mosher, Chas. D. .... New York.  
 Nease & Levy Ship & Engine Bldg. Co. Philadelphia.  
 Newport News Ship Building Co. Newport News, Va.  
 Pusey & Jones Co. .... Wilmington, Del.  
 Riesdon Iron Works .... San Francisco.  
 Roach's Ship Yard .... Chester, Pa.  
 Thropp, J. E. & Sons Co. .... Trenton, N. J.  
 Sheriff's Mfg. Co. .... Milwaukee.  
 Superior Ship Building Co. .... Superior, Wis.  
 Trout, H. G. .... Buffalo.  
 United States Shipbuilding Co. .... New York.  
 Warrington Iron Works .... Chicago.  
 Willard, Chas. P. & Co. .... Chicago

## ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son .... New York.  
 Electro-Dynamic Co. .... Philadelphia.  
 MacLean Hydraulic Signal Co. .... Chicago.

## ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co. .... Chicago.  
 Farnan Brass Works .... Cleveland.  
 Kiley & Mueller .... New York.  
 Lunkenheimer Co. .... Cincinnati.  
 McCutcheon, C. H. .... Buffalo.  
 New York Belting & Packing Co. .... New York.  
 Belly Repair & Supply Co., James .... New York.

ENGINEERS, MARINE, MECHANICAL,  
CONSULTING.

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 Garrett-Cromwell Engineering Co. .... Cleveland.  
 Gaskin, Edward .... Buffalo.  
 Hunt, Robt. W. & Co. .... Chicago.  
 Kidd, Joseph .... Duluth, Minn.  
 Logan, Robert .... Cleveland.  
 Mosher, Chas. D. .... New York.  
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 Pittsburgh Testing Laboratory, Ltd. .... Pittsburgh.  
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 Roelker, H. B. .... New York.  
 Sadler, Perkins & Field .... New York.  
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## EVAPORATING AND DISTILLING APPARATUS.

Belly Repair & Supply Co., James .... New York.

## FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co. .... Boston.

## FEED WATER PURIFIERS AND HEATERS.

Larmouth, Robert .... Buffalo.  
 Belly Repair & Supply Co., James .... New York.  
 Ross Valve Co. .... Troy, N. Y.

## FIXTURES FOR LAMPS, OIL AND ELECTRIC.

General Electric Co. .... Schenectady, N. Y.  
 Westinghouse Electric & Mfg. Co. .... Pittsburgh, Pa.

## FORGES.

Sturtevant, B. F. Co. .... Boston.

FORGINGS FOR CRANE, PROPELLER OR  
THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co. .... Cleveland.  
 Fore River Ship & Engine Co. .... Quincy, Mass.  
 Macbeth Iron Co. .... Cleveland.

## FLUE WELDING.

Fix's, S. Sons .... Cleveland.

## FURNACES FOR BOILERS.

Continental Iron Works .... New York.

## FUELING COMPANIES AND COAL DEALERS.

Castner, Curran & Bullitt (Pocahontas) .... Phila.  
 Graham Coal & Coke Co., Ltd. .... Detroit.  
 Hanna, M. A. & Co. .... Cleveland.  
 Pickands, Mather & Co. .... Cleveland.  
 Pittsburgh Coal Co. .... Cleveland.  
 Rochester & Pittsburgh Coal & Iron Co. .... Buffalo.  
 Smith, Stanley B. & Co. .... Detroit.  
 Smith Coal & Dock Co., Stanley B. .... Toledo, O.  
 Youghiogheny & Lehigh Valley Coal Co. .... Chicago.

## GASKETS, RUBBER.

New York Belting & Packing Co. .... New York.

## GAS BUOYS.

Safety Car Heating & Lighting Co. .... New York.

## GAS AND GASOLINE ENGINES.

Chase Machine Co. .... Cleveland.

## GAGES, STEAM AND VACUUM.

American Steam Gauge Co. .... Boston.  
 Ashton Valve Co. .... Boston.  
 Lunkenheimer Co. .... Cincinnati.

## GRAPHITE.

Dixon Crucible Co., Joseph .... Jersey City, N. J.

## HAMMERS, STEAM.

Chase Machine Co. .... Cleveland.

## HARDWARE, SHIP.

Topsy Brothers .... Ashtabula, O.

## HATCH GEARS.

"Long-Arm" System Co. .... Cleveland.

## HEATING APPARATUS.

Sturtevant, B. F. Co. .... Boston.

## HOISTS FOR CARGO, ETC.

American Ship Building Co. .... Cleveland.

Brown Holsting Machinery Co., Inc. .... Cleveland.

Chase Machine Co. .... Cleveland.

Elwell-Parker Electric Co. .... Cleveland.

General Electric Co. .... New York.

Hyde Windlass Co. .... Bath, Me.

Lidgerwood Mfg. Co. .... New York.

Marine Iron Co. .... Bay City.

Westinghouse Electric & Mfg. Co. .... Pittsburg, Pa.

## HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co. .... Cuyahoga Falls, O.

## HOSE FITTINGS.

Farnan Brass Works .... Cleveland.

## HOSE, RUBBER.

New York Belting & Packing Co. .... New York.

## HYDRAULIC MACHINERY.

Watson-Stillman Co., The .... New York.

## ICE MACHINERY.

American Linde Refrigerating Co. .... New York.

Roelker, H. B. .... New York.

## INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co. .... Boston.

Ashton Valve Co. .... Boston.

## INJECTORS.

American Injector Co. .... Detroit.

Crane Co. .... Chicago.

Jenkins Bros. .... New York.

Lunkenheimer Co. .... Cincinnati.

Pemberthy Injector Co. .... Detroit, Mich.

## INSURANCE, MARINE.

Brown & Co. .... Buffalo.

Brown, W. W. .... Cleveland.

Dunham, R. J. .... Chicago.

Elphick, C. W. & Co. .... Chicago.

Fleming & Co., P. H. .... Chicago.

Hawgood & Co., W. A. .... Cleveland.

Heim & Co., D. T. .... Duluth.

Hutchinson & Co. .... Cleveland.

McCarthy, T. B. .... Montreal.

McCurdy, Geo. L. .... Chicago.

Mitchell & Co. .... Cleveland.

Peck, Chas. E. & W. F. .... New York and Chicago.

Richardson, W. C. .... Cleveland.

Sullivan, D. & Co. .... Chicago.

Weeks, F. H. .... New York.

## IRON ORE AND PIG IRON.

Bourne-Fuller Co. .... Cleveland.

Hanna, M. A. & Co. .... Cleveland.

Pickands, Mather & Co. .... Cleveland.

## LAUNCHES—STEAM, MARMATHA, ELECTRIC.

Marine Construction & D. D. Co. ....

.....Mariner's Harbor, S. I., N. Y.

Truscott Boat Mfg. Co. .... St. Joseph, Mich.

Warrington Iron Works .... Chicago.

Willard, Chas. P. .... Chicago.

## LIFE FLOATS.

Carley Life Float Co. .... New York.

## LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong Cork Co. .... Pittsburgh.

Drin, Thos. & Son .... Wilmington, Del.

Kahnweiler's Sons, D. .... New York.

Lane & DeGroot .... Long Island City, N. Y.

Marine Construction & Dry Dock Co. ....

.....Mariner's Harbor, S. I., N. Y.

## LIGHTS, SIDE AND SIGNAL.

Holvig, H. A. J. .... New York.

Russell & Watson .... Buffalo.

## LOGS.

Negus, T. S. & J. D. .... New York.

Nicholson Ship Log Co. .... Cleveland.

Walker & Sons, Thomas .... Birmingham, Eng.

Also Ship Chandlers.

## LUMBER.

Martin-Barris Co. .... Cleveland.

Moran Bros. Co. .... Seattle, Wash.

Shurick, F. S. .... New York

## MACHINISTS.

Chase Machine Co. .... Cleveland.

Macbeth Iron Co. .... Cleveland.

Union Machine & Boiler Co. .... Cleveland.

## MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc. .... Philadelphia.

## MAN-HOLES, SWING DOORS, ETC.

"Long-Arm" System Co. .... Cleveland.

## MARINE RAILWAYS, BUILDERS OF

Crandall & Son, H. I. .... East Boston, Mass.

## MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W. .... New York.

## MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co. .... Cleveland.

Bloomsburg & Co., H. .... Baltimore, Md.

Detroit Ship Building Co. .... Detroit.

Sturtevant, B. F. Co. .... Boston.

## METALLIC PACKING.

Hayden Mfg. Co., N. L. .... Columbus, O.

Katzenstein, L. & Co. .... New York.

U. S. Metallic Packing Co. .... Philadelphia.

## METAL POLISH.

Bertram's Oil Polish Co. .... Boston.

## MOTORS, GENERATORS—ELECTRIC.

Electro-Dynamic Co. .... Philadelphia.

Elwell-Parker Electric Co. .... Cleveland.

General Electric Co. .... Schenectady, N. Y.

"Long Arm" System Co. .... Cleveland.

Sturtevant, B. F. Co. .... Boston.

Westinghouse Electric & Mfg. Co. .... Pittsburgh, Pa.

## NAUTICAL INSTRUMENTS.

Bliss, John & Co. .... New York.

Negus, T. S. & J. D. .... New York.

Ritchie, E. S. & Sons .... Brookline, Mass.

## NAVAL ARCHITECTS.

Gaskin, Edward .... Buffalo.

Kidd, Joseph .... Duluth, Minn.

Logan, Robert .... Cleveland.

Mosher, Chas. D. .... New York.

Newman, R. L. .... New York.

Sadler, Perkins & Field .... New York.

Wood, W. J. .... Chicago.

## OAKUM.

DeGraw, Aymar & Co. .... New York.

Stratford Oakum Co. .... Jersey City, N. J.

## OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph .... Jersey City, N. J.

Standard Oil Co. .... Cleveland.

## PACKING.

Crane Co. .... Chicago.

Hayden Mfg. Co., N. L. .... Columbus, O.

Jenkins Bros. .... New York.

Katzenstein, L. & Co. .... New York.

New York Belting & Packing Co. .... New York.

United States Metallic Packing Co. .... Philadelphia.

## PAINTS.

Baker, Howard H. & Co. .... Buffalo.

Berry Bros., Ltd. .... Detroit.

Mohawk Paint & Chemical Co. .... Norwich, Conn.

New Jersey Zinc Co. .... New York.

Topsy Brothers .... Ashtabula, O.

Upson-Walton Co. .... Cleveland.

## PATENT ATTORNEYS.

Thurston & Bates .... Cleveland.

## PATTERN SHOP MACHINERY.

Atlantic Works, Inc. .... Philadelphia.

## PIPE—BRASS AND COPPER, IRON PIPE SIZZ.

Waterbury Brass Co. .... New York.

## PIPE, WROUGHT IRON.

Bourne-Fuller Co. .... Cleveland.

Crane Co. .... Chicago.

Macbeth Iron Co. .... Cleveland.

## PLANING MILL MACHINERY.

Atlantic Works, Inc. .... Philadelphia.

## PLUMBING, MARINE.

Mott, J. L., Iron Works .... New York.

Rally Repair & Supply Co., James .... New York.

Sands, Alfred B. & Son .... New York.

## PNEUMATIC TOOLS.

Allen, John F. .... New York.

Chicago Pneumatic Tool Co. .... Chicago.

## POLISH FOR METALS.

Bertram's Oil Polish Co. .... Boston.

## POWER DOORS AND HATCHES.

"Long-Arm" System Co. .... Cleveland.

## PRESSURE REGULATORS.

Kiley & Mueller .... New York.

Ross Valve Co. .... Troy, N. Y.

## BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

## PROPELLER WHEELS.

American Ship Building Co. .... Cleveland  
 Atlantic Works ..... East Boston, Mass.  
 Bath Iron Works, Ltd. .... Bath, Me.  
 Cramp, Wm. & Sons. .... Philadelphia  
 Crescent Ship Yard Co. .... Elizabethport, N. J.  
 Detroit Ship Building Co. .... Detroit  
 Fore River Ship & Engine Co. .... Quincy, Mass.  
 Great Lakes Engineering Works. .... Detroit  
 Hyde Windlass Co. .... Bath, Me.  
 Jenks Ship Building Co. .... Port Huron, Mich.  
 Lockwood Mfg. Co. .... East Boston, Mass.  
 Macbeth Iron Co. .... Cleveland  
 MacKinnon Mfg. Co. .... Bay City, Mich.  
 Maryland Steel Co. .... Sparrow's Point, Md.  
 Milwaukee Dry Dock Co. .... Milwaukee  
 Moran Bros. Co. .... Seattle, Wash.  
 Neale & Levy Ship & Engine Bldg. Co. .... Phila.  
 Newport News Ship Bldg. Co. .... Newport News, Va.  
 Phosphor Bronze Smelting Co., Ltd. .... Philadelphia  
 Pusey & Jones Co. .... Wilmington, Del.  
 Rason Iron Works ..... San Francisco  
 Boecker, H. B. .... New York  
 Sheriff's Mfg. Co. .... Milwaukee  
 Superior Ship Building Co. .... Superior, Wis.  
 Thropp & Sons Co., J. E. .... Trenton, N. J.  
 Trout, H. G. .... Buffalo  
 United States Shipbuilding Co. .... New York

## PROJECTORS, ELECTRIC.

Elwell-Parker Electric Co. .... Cleveland  
 General Electric Co. .... Schenectady, N. Y.  
 Westinghouse Electric & Mfg. Co. .... Pittsburgh, Pa.

## PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F. Mfg. Co. .... New York  
 Clyde Machine Works ..... Chicago  
 Great Lakes Engineering Works. .... Detroit  
 Kingsford Foundry & Machine Wks. Oswego, N. Y.  
 Long Arm System Co. .... Cleveland

## PUNCHES, RIVETERS, SHEARS.

Chicago Pneumatic Tool Co. .... Chicago

## REFRIGERATING APPARATUS.

Boecker, H. B. .... New York

REGISTER FOR CLASSIFICATION OF VESSELS.  
 Great Lakes Register ..... Cleveland  
 Record of American & Foreign Shipping. New York

RELEASING HOOKS FOR DETACHING BOATS.  
 Standard Automatic Releasing Hook Co. New York

RIVETS, STEEL, FOR SHIPS AND BOILERS.  
 Bourne-Fuller Co. .... Cleveland

## RANGES.

Russell & Watson ..... Buffalo

## RIVETS—BRASS AND COPPER.

Waterbury Brass Co. .... New York

## RUBBER INSULATED WIRES.

Koebling's Sons, Inc. A. .... New York and Cleveland

## SAFETY VALVES.

American Steam Gauge Co. .... Boston  
 Ashton Valve Co. .... Boston  
 Hayden Mfg. Co., N. L. .... Columbus, O.  
 Lunkenheimer Co. .... Cincinnati

## SAIL MAKERS.

Baker, Howard H. & Co. .... Buffalo  
 Upson-Walton Co. .... Cleveland  
 Wilson & Sibley ..... Boston

## SALVAGE COMPANIES.

See Wrecking Companies.

## SEARCH LIGHTS.

Elwell-Parker Electric Co. .... Cleveland  
 General Electric Co. .... Schenectady, N. Y.  
 Westinghouse Electric & Mfg. Co. .... Pittsburgh, Pa.

## SHEARS.

See Punches, Rivets, and Shears.

## SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co. .... Cleveland

## SHIP BUILDERS.

American Ship Building Co. .... Cleveland  
 Atlantic Works ..... East Boston, Mass.  
 Bath Iron Works, Ltd. .... Bath, Me.  
 Buffalo Dry Dock Co. .... Buffalo  
 Columbia Iron Works ..... Port Huron  
 Cramp, Wm. & Sons. .... Philadelphia  
 Craig Ship Building Co. .... Toledo, O.

Chicago Ship Building Co. .... Chicago  
 Crescent Ship Yard Co. .... Elizabethport, N. J.  
 Detroit Ship Building Co. .... Detroit  
 Fore River Ship & Engine Co. .... Quincy, Mass.  
 Great Lakes Engineering Works. .... Detroit  
 Jenks Ship Building Co. .... Port Huron, Mich.  
 Lockwood Mfg. Co. .... East Boston, Mass.  
 Manitowoc Dry Dock Co. .... Manitowoc, Wis.  
 Marine Construction & Dry Dock Co. ....  
 Mariner's Harbor, S. I., N. Y.  
 Maryland Steel Co. .... Sparrow's Point, Md.  
 Milwaukee Dry Dock Co. .... Milwaukee  
 Moran Bros. Co. .... Seattle, Wash.  
 Neale & Levy Ship & Engine Bldg. Co. .... Phila.  
 Newport News Ship Bldg. Co. .... Newport News, Va.  
 Pusey & Jones Co. .... Wilmington, Del.  
 Rason Iron Works ..... San Francisco  
 Roach's Ship Yard ..... Chester, Pa.  
 Shipowners Dry Dock Co. .... Chicago  
 Smith & Son, Abram. .... Algonac, Mich.  
 United States Shipbuilding Co. .... New York  
 Warrington Iron Works ..... Chicago  
 Willard, Chas. P. & Co. .... Chicago

## SHIP CHANDLERS.

Baker, Howard H. & Co. .... Buffalo  
 Moran Bros. Co. .... Seattle, Wash.  
 Rilly Repair & Supply Co., James. .... New York  
 Upson-Walton Co. .... Cleveland

## SHIP LANTERNS AND LAMPS.

Helvig, H. A. J. .... New York  
 Russell & Watson ..... Buffalo

## SHIP TIMBER.

Martin-Barriss Co. .... Cleveland  
 Moran Bros. Co. .... Seattle, Wash.  
 Shurick, F. S. .... New York

## SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co. .... Jersey City, N. J.

## SPARS—LARGE SIZES.

Moran Bros. Co. .... Seattle, Wash.

## STAYBOLTS, IRON OR STEEL, HOLLOW, OR SOLID.

Falls Hollow Staybolt Co. .... Cuyahoga Falls, O.

## STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co. .... New York  
 Holmes, Samuel. .... New York  
 King, Rufus S. .... New York  
 McCarthy, T. E. .... Montreal, Can.  
 Newman, R. L. .... New York  
 Weeks, F. H. .... New York

## STEAMSHIP LINES, PASS. AND FREIGHT.

American Line ..... New York  
 Cleveland & Buffalo Transit Co. .... Cleveland  
 Erie & Western Trans. Co. .... Buffalo  
 Goodrich Trans. Co. .... Chicago  
 International Nav. Co. .... Philadelphia  
 Pere Marquette R. R. & S. S. Line. .... Milwaukee  
 Red Star Line ..... New York

## STEEL CASTINGS.

Seaboard Steel Casting Co. .... Chester, Pa.  
 Macbeth Iron Co. .... Cleveland

## STEERING APPARATUS.

American Ship Building Co. .... Cleveland  
 Chase Machine Co. .... Cleveland  
 Dako Engine Co. .... Grand Haven, Mich.  
 Detroit Shipbuilding Co. .... Detroit  
 Electro-Dynamic Co. .... Philadelphia  
 Hyde Windlass Co. .... Bath, Me.  
 Jenks Ship Building Co. .... Port Huron, Mich.  
 Sheriff Mfg. Co. .... Milwaukee

## STOCKS, BONDS, SECURITIES.

Brown, W. W. .... Cleveland  
 Fahey & Co. .... Cleveland

## SUBMARINE DIVING APPARATUS.

Morse & Son, A. J. .... Boston  
 Schrader's Son, A. .... New York

## SURVEYORS, MARINE.

Gaskin, Edward. .... Buffalo  
 Newman, R. L. .... New York  
 See, Horace. .... New York  
 Wood, W. J. .... Chicago

## TESTS OF MATERIAL.

Hunt, Robert W. & Co. .... Chicago  
 Pittsburgh Testing Laboratory, Ltd. .... Pittsburgh

## TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co. .... New York

## TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F. .... New York  
 Chicago Pneumatic Tool Co. .... Chicago  
 Watson-Stillman Co. .... New York

## TOOLS, WOOD WORKING.

Atlantic Works, Inc. .... Philadelphia

## TOWING MACHINES.

American Ship Windlass Co. .... Providence, R. I.  
 Chase Machine Co. .... Cleveland

## TOWING COMPANIES.

Donnelly Salvage & Wrecking Co. .... Kingston, Ont.  
 Midland Towing & Wrecking Co., Ltd. .... Midland, Ont.

## TRAPS, STEAM.

Kieley & Mueller ..... New York  
 Lunkenheimer Co. .... Cincinnati

## TRUCKS.

Boston & Lockport Block Co. .... Boston

## TUBING, SEAMLESS.

Shelby Steel Tube Co. .... Pittsburgh, Pa.  
 Waterbury Brass Co. .... New York

## VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge Co. .... Boston  
 Ashton Valve Co. .... Boston  
 Bordo, L. J. .... Philadelphia  
 Crane Co. .... Chicago  
 Farnam Brass Works ..... Cleveland  
 Hayden Mfg. Co., N. L. .... Columbus, O.  
 Jenkins Bros. .... New York  
 Kieley & Mueller ..... New York  
 Lunkenheimer Co. .... Cincinnati  
 Ross Valve Co. .... Troy, N. Y.

## VALVES FOR WATER AND GAS.

Ross Valve Co. .... Troy, N. Y.

## VARINIKES.

Berry Brothers, Ltd. .... Detroit  
 New Jersey Zinc Co. .... New York  
 Also Ship Chandlery

## VESSEL CASTINGS.

American Ship Building Co. .... Cleveland  
 Macbeth Iron Co. .... Cleveland

## VESSEL AND FREIGHT AGENTS.

Boland, John J. .... Buffalo  
 Brown & Co. .... Buffalo  
 Brown, W. W. .... Cleveland  
 Dunham, R. J. .... Chicago  
 Elwell, Jas. W. & Co. .... New York  
 Elphick, C. W. & Co. .... Chicago  
 Fleming & Co., P. H. .... Chicago  
 Hall & Root. .... Buffalo  
 Helm & Co., D. T. .... Duluth  
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 Sullivan, D. & Co. .... Chicago  
 Weeks, F. H. .... New York

## VENTILATING APPARATUS FOR SHIPS.

Starkevart, E. F. Co. .... Boston

## WIRE—BRASS AND COPPER.

Waterbury Brass Co. .... New York

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Baker, H. H. & Co. .... Buffalo  
 DeGrasw, Aymar & Co. .... New York  
 Upson-Walton Co. .... Cleveland

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 Ashton Valve Co. .... Boston  
 Farnam Brass Works ..... Cleveland  
 Lunkenheimer Co. .... Cincinnati

## WHITE METAL—SHEETS, RODS AND WIRE.

Waterbury Brass Co. .... New York

## WINDLASSES.

American Ship Windlass Co. .... Providence, R. I.  
 American Ship Building Co. .... Cleveland  
 Hyde Windlass Co. .... Bath, Me.  
 Jenks Ship Building Co. .... Port Huron, Mich.

## WINCHES.

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 Hyde Windlass Co. .... Bath, Me.

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## WRECKING AND SALVAGE COMPANIES.

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 Midland Towing & Wrecking Co., Ltd. .... Midland, Ont.

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Drain, Thos. & Son ..... Wilmington, Del.  
 Lane & DeGroot ..... Long Island City, N. Y.  
 Marine Construction & Dry Dock Co. .... New York  
 Truscott Boat Mfg. Co. .... St. Joseph, Mich.  
 Warrington Iron Works ..... Chicago  
 Willard, Chas. P. & Co. .... Chicago

## YAWLS.

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No. 32, Southern Express. ....  
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7:40am \*8:00am  
10:00am \*10:40am  
11:25am \*11:30am  
11:45pm ..  
... \*3:00pm  
\*4:30pm \*4:45pm  
\*5:40pm \*5:45pm  
\*7:40pm \*7:45pm  
\*7:45pm \*7:50pm  
10:30pm \*10:35pm  
10:45pm \*10:45pm  
11:10pm \*11:25pm  
11:30am ..

### Arrive from East.

1:50am  
3:10am \*3:15am  
7:15am \*7:20m  
10:30am \*10:35am  
12:25pm ..  
... \*12:45p m  
11:20am \*12:00pm  
12:30pm \*12:45pm  
4:35pm \*4:40pm  
7:00pm \*7:20pm  
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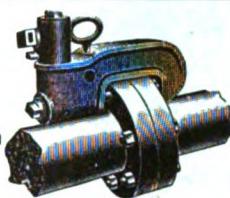
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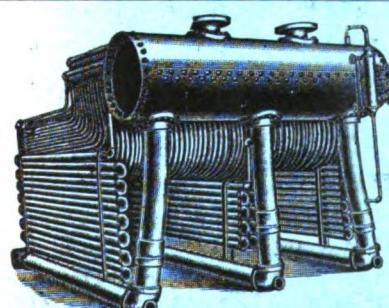
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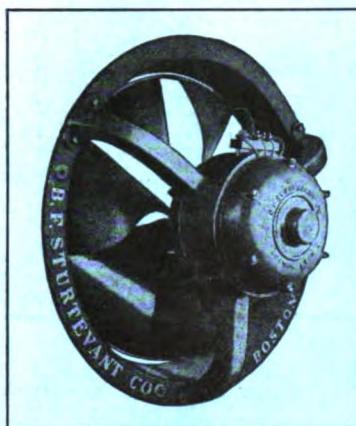
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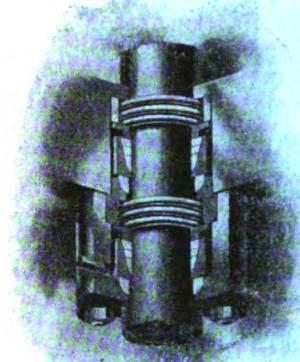


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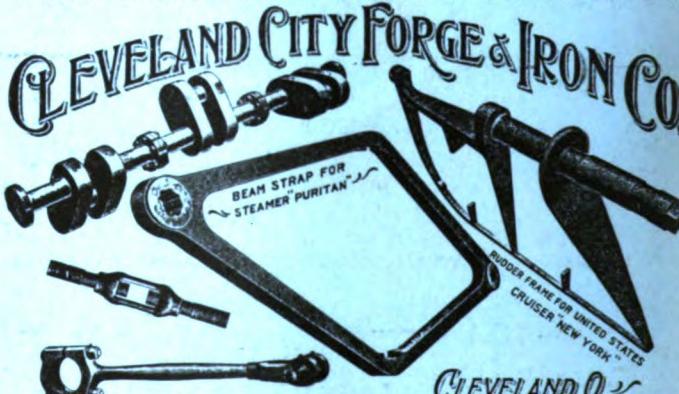
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